A SYSTEMATIC REVISION OF THE AMENIINAE (DIPTERA: CALLIPHORIDAE)

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CONTENTS

SYNOPSIS

The Ameniinae are fully revised and their affinities discussed ; no evidence is found of affinity with true Tachinidae, and contrary to usual practice the group is excluded from this family and treated as a subfamily of Calliphoridae. Seven genera (one new) and thirty-one species (nine new) are recognised ; five generic, eleven specific and one subspecific name are newly placed in synonymy, and there are five new generic combinations. Keys are provided for the identification of all genera and species, and a summary is given of the revised classification proposed.

INTRODUCTION

A GENERAL systematic study of the Tachinidae of the Oriental and Australian regions currently in progress has necessitated a study of the Ameniine flies to determine whether the group should, following the majority of authors, be included in the true Tachinidae or whether its affinities lie with the Calliphoridae. Townsend (1935, 1937) and van Emden (1950, 1951), departing from earlier work, placed the group in the Calliphoridae, but Paramonov (1957) has more recently treated the Ameniine flies as a tribe of Tachinidae allied to the Rutiliini ; in the present work the group is treated, on the basis of evidence adduced in a later section, as a subfamily of Calliphoridae. The Ameniinae is certainly an anomalous group, and has been much neglected by specialists on higher Diptera ; apart from the scattered papers of Malloch (1927, 1928a, 1928b, 1929, 1930, 1933, 1935) only the revisions of Rutiliinae by Engel (1925) and Enderlein (1936), and a review of Australian species by Paramonov (1957), have been available for identification. Unfortunately neither Engel nor Enderlein saw the types of most of the species they discussed, and both saw very little material, so that their work is much confused by misidentification, and most of the names in Hardy's (1938) key to the species of *Amenia* are also misapplied. To unravel past confusion it has been necessary here to give a full re-description of all species, especially since several species were hitherto known only from a few brief lines in old scattered works of nineteenth-century authors.

Thirty-seven previously described species are involved in this revision and the holotypes or syntypes of thirty-five of these have been examined, thirty-two personally and three (the types were not available on loan) by specialist colleagues. Paratypes of one other species have been examined which are undoubtedly conspecific with the holotype, and the type of the one remaining species is lost (*Amenia imperialis* Robineau-Desvoidy, for which a neotype is designated on page 109). A lectotype has been designated and labelled for each species without specified holotype and based on syntypes, and the available syntypes left after lectotype designation have each been labelled as paralectotype.

After examination of types only twenty-two of the thirty-seven previously described species are upheld in the present work, giving, with the nine new species, a total fauna of thirty-one species in the Ameniinae ; two of the previously described species (*Ptylostylum albomaculatum* Macquart and *Amenia dubitalis* Malloch) are accorded subspecific status only. The remaining thirteen names of previously

described species are here treated in synonymy, eleven being newly established synonyms ; the one previously published subspecific name (*enderleini* Paramonov, see p. 115) is also synonymized.

Of the fourteen described genera belonging in the Ameniinae only six are regarded as valid ; one new genus is added.

MATERIAL STUDIED

No single institution has an extensive collection of Ameniine flies, and the present work is based on a study of 746 specimens assembled from the following museums (abbreviations given are those used throughout the text in the lists of material examined) :

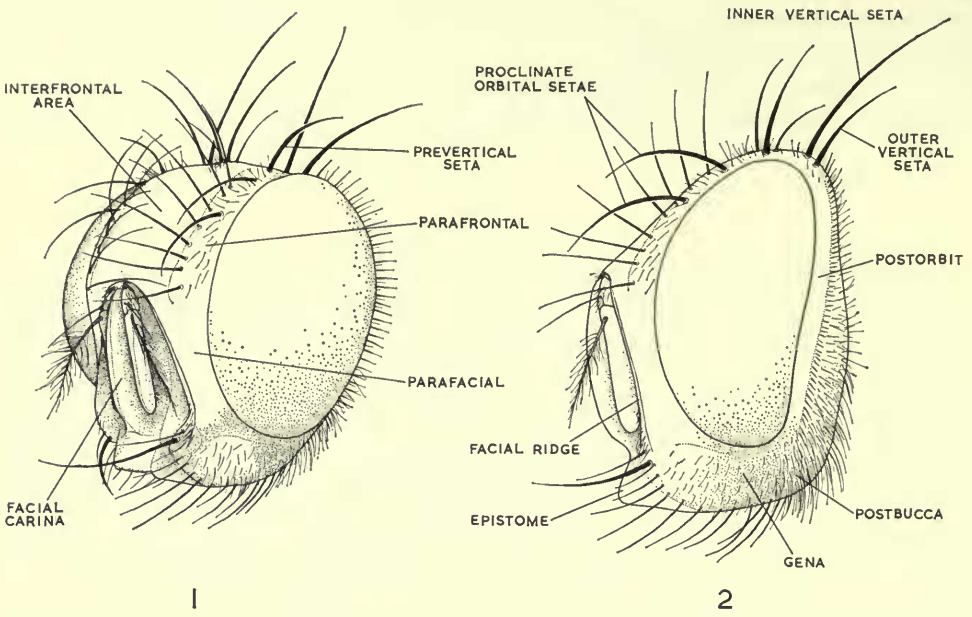
British Museum (Natural History), London (B.M. Nat. Hist.) ; Deutsches Entomologisches Institut, Berlin (D. Ent. Inst.) ; Division of Entomology Museum, C.S.I.R.O., Canberra (Div. Ent. Mus. Canberra) ; Naturhistorisches Museum, Vienna (Nat. Mus. Vienna) ; Rijksmuseum van Natuurlijke Historie, Leiden (Rijksmus. Leiden) ; School of Public Health and Tropical Medicine, Sydney (S.P.H.T.M.) ; Staatliches Museum für Naturkunde, Stuttgart (Staatl. Mus. Stuttgart) ; United States National Museum, Washington (U.S. Nat. Mus.) ; Universitetets Zoologiske Museum, Copenhagen ; University Museum, Oxford (Oxford Mus.) ; Zoölogisch Museum, Amsterdam (Zool. Mus. Amsterdam) ; Zoologische Sammlung des Bayerischen Staates, Munich (Zool. Sammlung, Munich) ; Zoologisches Museum der Humboldt-Universität, Berlin (Zool. Mus. Humb. Univ.).

METHODS EMPLOYED

Taxonomic characters, terms and measurements

At present only adult morphological characters are available for classification. In many Calyptrate flies the male genitalia are of great value in providing specific characters, but in the Ameniinae the male hypopygium is extremely uniform morphologically (cf. Text-figs. 31–42) and is usually virtually indistinguishable even in forms belonging in different genera and differing enormously on external characters. Only in a few species do the male genitalia provide valuable systematic characters, and classification of the Ameniinae must at present be based almost entirely on non-genitalic characters.

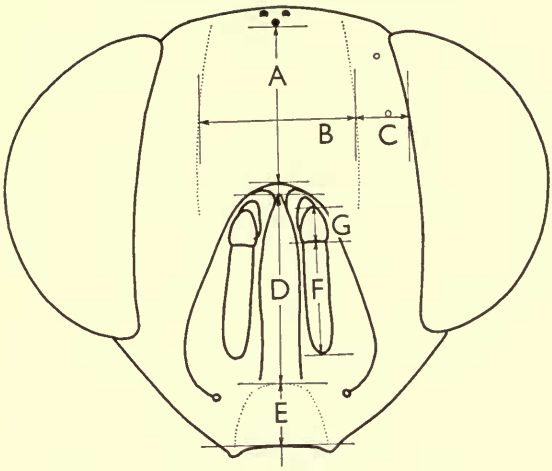
The head provides the most useful characters : terms used for head regions and chaetotaxy are shown in Text-figs. 1 and 2, and the measurement points used in determining the relative proportions of different head structures are shown in Text-figs. 3–6. The following structural proportions often provide valuable specific characters : length of facial carina (D) relative to epistome (E) or distance from lunula to anterior ocellus (A) ; width of interfrontal area (B) relative to width of parafrontal at corresponding point (C) (measured at level of lower proclinate orbital



FIGS. 1 and 2. Head of an Ameniine fly showing terms used in text. Drawn from *Silbomyia latigena* Enderlein.

seta since this provides fixed landmark) ; length of third antennal segment relative to second (F to G) ; width of parafacial (H) at mid point relative to width of third antennal segment (J) ; width of gena (K) as proportion of eye-height (L) ; width of vertex (N) relative to one eye viewed from above (M) in females and males with broad frons ; width of frons at narrowest point (P) as proportion of head width (Q) in males with approximated eyes. Measurements A, B, C, H, and J have been made with the head appropriately oriented so as to avoid foreshortening effect of straight facial or profile view. Head chaetotaxy is of little or no value at specific level, but presence or absence of outer vertical, prevertical and proclinate orbital setae in males is of some value as a supporting generic character.

Thoracic chaetotaxy is very uniform and provides no useful characters except that the position of the outer posthumeral seta (whether mesad or laterad of a longitudinal line through the presutural seta—Text-figs. 9 and 10) is a secondary character supporting the distinction of two tribes ; however even this character must be used with caution, since the outer posthumeral seta may be missing altogether in some specimens. Similarly the presutural intra-alar seta may be present or absent, but systematic importance cannot be attributed to this ; certain setae may in freak specimens be duplicated (giving for instance five instead of the normal four postsutural dorsocentral setae, or four instead of the normal three sternopleural setae). The chaetotaxy of the legs is also uniform, but the presence



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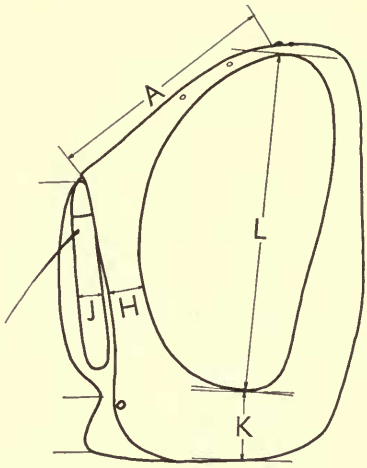

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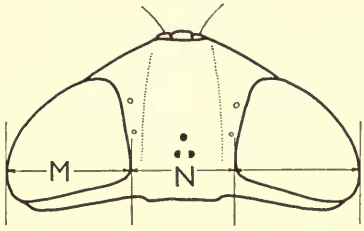

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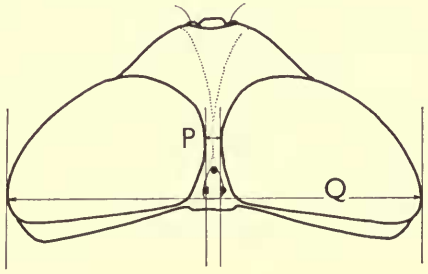

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FIGS. 3–6. Outline drawings of head of Ameniine fly showing measurement points used for determining proportions of head structures. Lunula to anterior ocellus (A). Width of interfrontal area (B) relative to parafrontal at level of lower proclinate orbital seta (C). Length of facial carina (D) relative to epistome (E). Length of third antennal segment (F) relative to second segment (G). Width of parafacial at mid point (H) relative to width of third antennal segment (J). Width of gena (K) as proportion of eye-height (L). Width of vertex (N) relative to one eye viewed from above (M) in females and males with broad frons. Frons width at narrowest (P) as proportion of total head width (Q) in males with reduced frons and strongly approximated eyes.

or absence of postero-dorsal setae on the fore tibia and the number (whether one or two) of postero-ventral setae on this tibia are of some generic value ; the number of antero-dorsal setae on the mid tibia usually varies within a species, but is of some value as a specific character in *Paramenia*.

In the wings the degree of infuscation is remarkably constant within a species and differs between species, providing a useful character in *Silbomyia*. Wing venation varies only in detail, in the forward bowing of the costa of the males of some *Amenia*, in the remoteness of the bend of vein *M* from the wing margin and the position of *r–m* cross-vein relative to the discal cell. Where appropriate, measurements have been made of the relative proportions (see Text-fig. 17) of *r–m* to *m–cu*, *m–cu* to bend of *M*, and bend to wing-margin (point of measurement on the wing margin determined by where an imaginary line extended from *M* basad of the bend intersects with the margin). A previously undiscovered character of great use in defining *Silbomyia* is the presence of fine setulae on the ventral surface of the second costal sector (Text-fig. 23).

Abdominal chaetotaxy is of very limited use : presence or absence of median marginal setae on T1+2 is of some value in *Silbomyia*, and the unusual character of an irregular row of marginal setae on T4 is diagnostic for *Formosiomima*. The inclination (whether erect or recumbent) of hair on the tergites and the presence of long dense hair on the venter of some males also provide characters. Abdominal shape differs but provides a character difficult to define satisfactorily. The fifth sternite of the ♂ produces no bizarre developments such as occur in many Calyptrates and is of almost no taxonomic value in Ameniinae, except to a limited extent in *Platytropesa*.

The arrangement of white pollinosity on thorax and abdomen is very constant within the species and often provides a dependable character ; colour of head pollinosity and the underlying ground colour are also important. Thoracic and abdominal colour vary in most species from green to violaceous, but colour provides a useful character in *Amenia* and *Paramenia* where there is greater constancy.

Body length has been measured from the leading edge of facial carina to the apex of the abdomen with fly viewed in profile, and the wing length measured from the base of the epaulet.

Abbreviations

The abbreviations used in the keys and descriptions are as follows:

Thoracic setae : *acr*, acrostichal setae ; *dc*, dorsocentral setae ; *ph*, outer posthumeral seta ; *prs*, presutural seta ; *prst dc*, presutural dorsocentral setae ; *prst ia*, presutural intra-alar setae.

In describing the positions of setae on the legs the convention is followed of imagining the leg to be extended at right-angles to the longitudinal axis of the fly, when : *a*, anterior ; *ad*, antero-dorsal ; *pd*, postero-dorsal ; *pv*, postero-ventral.

Wings : *m–cu*, posterior cross-vein ; *M*, fourth vein ; R_1, first vein ; R_{2+3}, second vein ; R_{4+5}, third vein ; *Sc*, subcosta. Abdomen : T=tergite ; the composite first apparent tergite is T1+2, and successive tergites are numbered accordingly, the last apparent tergite therefore T5 (as in Text-fig. 27).

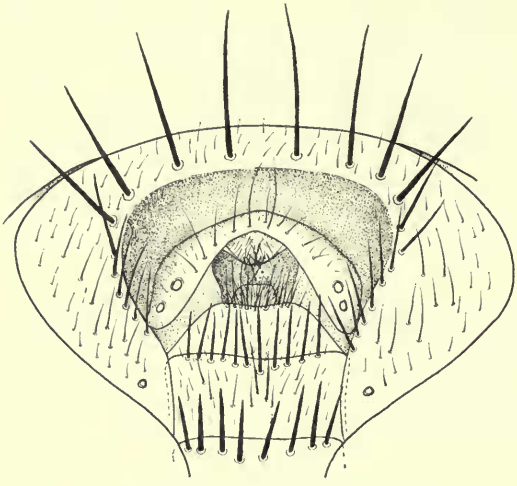
RELATIONSHIPS AND SYSTEMATIC STATUS OF THE GROUP

Amenia and its allied genera were first given family-group status by Brauer and Bergenstamm (1889), who erected the Ameniidae as " Gruppe XLVI " in their classification of the " Muscaria Schizometopa ". Although given a family ending the " Gruppen " of Brauer and Bergenstamm are approximately equivalent to tribes in current classifications of Tachinoid Diptera, and no recent author has accorded family status to the group. Brauer and Bergenstamm (1889) placed their Ameniidae immediately before their groups Amphiboliidae (Gruppe XLVII) and Rutiliidae (Gruppe XLVIII), and in their later systematic catalogue (Brauer and Bergenstamm, 1891 : 417–418) sandwiched the group between their Paradexiidae (Gruppe XXV) on the one hand and their Amphiboliidae and Rutiliidae on the other ; such arrangement clearly implied that Brauer and Bergenstamm considered the affinities of *Amenia* and relatives to lie with the Dexillinae and Rutiliinae, groups now forming part of the Tachinidae.

It is not surprising that Brauer and Bergenstamm should have reached this conclusion, since the superficial resemblance between Ameniinae and Rutiliini (the large size and metallic coloration and the heavily carinate face of most forms) is very remarkable, but it must now be recognized that the resemblances are convergent and that the affinities of the Ameniinae are almost certainly with the Calliphoridae and not at all with the Tachinidae. It is of interest to note that Robineau-Desvoidy had evidently recognized this in 1830, for in his " Essai sur les Myodaires " he at first (p. 320) placed *leonina* Fabricius, type-species of *Amenia*, in *Rutilia* Robineau-Desvoidy among his " Macropodées " but later in the same work (p. 444) assigned this species to his new genus *Amenia* near *Chrysomya* Robineau-Desvoidy in his " Muscides Métalliques ", remarking that " C'est à tort que j'ai placé cette belle espèce [*leonina*] parmi les Macropodées "; in moving *leonina* from his " Macropodées " to his " Muscides Métalliques " he was in effect moving it from a group now considered Tachinidae to a group now considered Calliphoridae (Robineau-Desvoidy has been the subject of unjustified obloquy by later dipterists but this example underlines his remarkable eye for affinity).

In recent times only Townsend (1935, 1937), van Emden (1950, 1951) and Herting (1957 : 441) have considered the affinities of the Ameniinae to lie with the Calliphoridae ; Townsend included *Amenia* and its allies in the Calliphorini, but gave no reasons for this radical departure from their previous position in Tachinidae. Van Emden (1950) drew attention to certain Calliphorid characters in the Ameniini, especially the male hypopygium (Engel, 1925, although placing *Silbomyia* and *Paramenia* in Rutiliinae, also noted the resemblance between the male genitalia of these genera and those of Calliphoridae and Hall, 1948 : 7, remarked that in *Silbomyia* " the form of the male genitalia is conspicuously calliphorid "). The slight development of a swollen postscutellum in Ameniinae (which led Malloch, 1927, to include the group in the Tachinidae instead of the Calliphoridae) is certainly an unreliable indicator of affinity, for a slightly swollen postscutellum occurs in several undoubted Calliphoridae, and that of the Ameniinae does not in any way resemble the very strongly swollen and smoothly convex postscutellum characteristic of true Tachinidae.

Other external characters also support Townsend's and van Emden's view of Ameniine affinities : a unique character of all Ameniinae not previously recorded is the characteristic tuft of long black hairs on the anterior lappet of the metathoracic spiracle (Text-fig. 8) ; no such tuft of hairs ever occurs in true Tachinidae, but some Calliphorinae have a few hairs in this position (e.g. *Catapicephala* Macquart,



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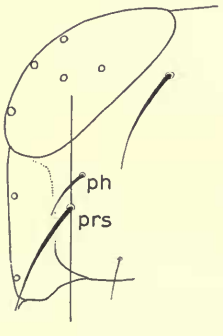

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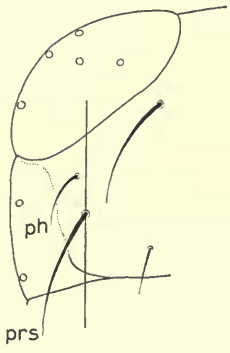

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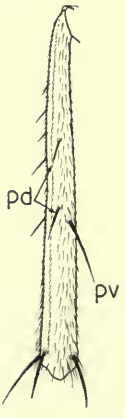

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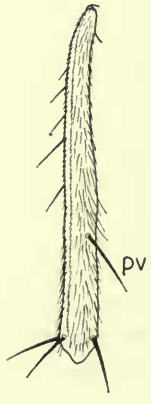

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FIGS. 7–12. 7. Ventro-apical view of ♀ terminalia of Ameniinae in situ, drawn from *Amenia sexpunctata* Malloch. 8. Metathoracic spiracle in Ameniinae : anterior lappet with characteristic group of long strong hairs. 9. Showing outer posthumeral seta (*ph*) in Ameniini, lying mesad of presutural seta (*prs*). 10. Showing outer posthumeral seta (*ph*) of Parameniini, lying laterad of presutural seta (*prs*). 11. Posterior surface of fore tibia of *Platytropesa*. 12. Posterior surface of fore tibia of *Stilbomyella*.

which closely resembles the Ameniinae and to some extent interconnects them with the Calliphorinae).

The most telling evidence that the Ameniinae are not Tachinidae is provided by what little is known of their biology. Townsend (1942 : 229) recorded that *Amenia* was parasitic upon the Melolonthid beetles *Lepidiota* and *Lepidoderma* and this record was accepted and repeated by van Emden (1950 : 196) but Hardy (1951 : 96) has pointed out that the record is erroneous and derives merely from a supposition in the economic literature given currency by Illingworth (1921 : 42) : the Ameniinae are certainly not parasites of the grubs of these sugar-cane beetles. It is now established from a brief note of Hardy (1951), later amplified by van Emden (1953), that *Amenia leonina* larvae occur in snails, and these authors assume that the Ameniinae are true parasites of living Mollusca, although this is not fully authenticated by evidence so far available.

The Ameniinae are undoubtedly larviparous and the female terminalia (Text-fig. 7) are typical of larviparous Calyptrate flies (see Herting, 1957 : 441–443); the postabdomen does not form a telescopic ovipositor as in typical Calliphorinae. There is no doubt that the larvae of Ameniinae are retained in the uterus to a very advanced stage of development (" macrolarviparity "), and it is obvious from the extensive development of soft membrane between the terminal sclerites of the female abdomen that it is modified for the deposition of very large larvae : probably only a single larva develops at one time, as in the South American Mesembrinellinae (Calliphoridae) and the African Glossinidae. The little-known observation of Illingworth (1921 : 42) supports this and deserves quotation : " The fourth [species : i.e. *Amenia imperialis*] is a brilliant green species with a bright yellow face . . . Dissection of the females, however, showed that they still retained a few maggots of rather large size ; and in one instance a maggot about $\frac{3}{8}$ inch in length was dropped by a fly that I was holding rather tightly ".

That the Ameniinae mature the larvae in utero and that the larvae attack snails confirms beyond doubt that the group cannot be included in the Tachinidae, for all true Tachinidae (from which I exclude the Rhinophoridae parasitic upon terrestrial Isopoda) are endoparasites of other insects in the larval stage and none retain the larvae until nearly mature.

Some genera of Sarcophagidae are parasitic in snails, and despite the very great superficial difference (the Ameniinae being large metallic flies) it is possible that the Ameniinae are as closely related to the Sarcophagidae as to the Calliphoridae. When more evidence is available on the biology of the group it may be better to treat it as a full family situated between the Sarcophagidae and the Calliphoridae, but for the present I consider it best to include it within Calliphoridae. Family limits within the Tachinoidea (this superfamily as here used includes the Tachinidae, Rhinophoridae, Sarcophagidae including Miltogrammatinae, and Calliphoridae) are in need of revision, but an improved classification would probably result if the peculiar groups such as Mesembrinellinae were treated as families : this curious group (which despite the presence of hypopleural setae may not be Tachinoidea at all) appears to be a Neotropical analogue to the Australian Ameniinae, also having

a non-telescopic female postabdomen and depositing mature larvae (Hall, 1948).

Zumpt (1956) includes the Sarcophaginae and Miltogrammatinae within the Calliphoridae, and uses the position of the outer posthumeral seta (whether laterad or mesad of the presutural seta) to distinguish these groups from Calliphorinae (Calliphoridae proper) ; this character appears to work for African forms and Palaearctic forms (Mesnil, 1944, uses it as a key character distinguishing Calliphorinae from Sarcophaginae), but present work casts some doubt on its value when the world fauna is considered. In the Ameniinae the outer posthumeral seta is almost always (tribe Ameniini) situated mesad of the presutural seta, but in *Paramenia* (Parameniini) is inserted laterad of the presutural seta—so that on Zumpt's (1956) key segregation by means of the outer posthumeral seta the Ameniini would enter the Calliphorinae and the Parameniini would run to the Sarcophaginae. There is an impressive concordance of characters between Ameniini and Parameniini (here jointly composing the subfamily Ameniinae) and it seems almost certain that the Ameniinae is monophyletic ; if so, then the character of the position of the outer posthumeral seta no longer appears a reliable one for subfamily definition.

Another dubious character is that of the presence or absence of minute hairs on the postorbits which Malloch (1935) remarked upon as a character distinguishing most Calliphoridae from most Tachinidae, and which Hall (1948), under the name " intrapostocular cilia " has used to distinguish all Sarcophagidae from most Calliphoridae ; in Ameniine flies the intrapostocular cilia are usually present (another typical Calliphorid character), but are variable and may or may not be present in specimens of the same species.

It should be noted that Senior White, Aubertin and Smart (1940) omitted the Oriental genus *Silbomyia* from their treatment of Oriental Calliphoridae, and presumably considered it as lying outside the limits of this family. However, they included *Catapicephala* Macquart in their Calliphorinae although this genus shows several features tending towards Ameniinae and away from typical Calliphorniae (non-telescopic female postabdomen, weakly developed postscutellum, few hairs on anterior lappet of metathoracic spiracle, etc.).

No entirely satisfactory characters appear to exist for defining supra-generic taxa in the Calliphoridae (or indeed in any Calyptrate flies) but the Ameniinae as here defined can be distinguished from other subfamilies reasonably easily by the following abbreviated key:*

1 Metathoracic spiracle with single large reniform lappet with dorsal opening. Vein *M* with evenly rounded bend. Female postabdomen not forming telescopic ovipositor. [Neotropical Region] . . . . . **MESEMBRINELLINAE**

– Metathoracic spiracle with normal anterior and posterior lappets. Vein *M* with bend distinctly angulate. Female postabdomen usually forming telescopic ovipositor. [All regions] 2

* Sarcophagidae and Rhinophoridae, sometimes treated as Calliphoridae, are here regarded as separate families, and *Pollenia* and allies (sometimes treated as separate subfamily) are included in Calliphorinae.

2 Stem-vein of wing with long fine setulae posteriorly on upper surface. Subalar bulla sometimes setulose . . . . . **RHINIINAE** and **CHRYSOMYIINAE**

– Stem-vein of wing bare. Subalar bulla always bare 3

3 Anterior lappet of metathoracic spiracle with a conspicuous backwardly-directed tuft of long hairs (Text-fig. 8). Postscutellum forming a definite convex swelling which is micro-rugose and shows slight trace of shallow median incision. Female postabdomen non-telescopic, modified for deposition of mature larvae. Head almost always with very strong facial carina separating antennae and reaching epistome. [Apparently parasites of living land snails, Oriental and Australian Regions] . . . . . **AMENIINAE**

– Anterior lappet of metathoracic spiracle bare or at most with a very few small inconspicuous hairs. Postscutellar region not at all convex or at most with rudimentary trace of swelling, not as above. Female postabdomen forming a telescopic ovipositor (some exceptions). Head without a facial carina or at most with rudimentary trace of carina between antennal bases. [Not parasites of snails. All regions]. . . . . **CALLIPHORINAE**

Subfamily **AMENIINAE**

Diagnosis and Bibliography

AMENIINAE Brauer and Bergenstamm, 1889

Medium-sized or large, usually metallic, Calliphoridae characterized as follows : *Primary characters :* Metathoracic spiracle with characteristic group of strong hairs on anterior lappet (Text-fig. 8), anterior lappet a little narrower than posterior one. Postabdomen of female not forming an extensible telescopic ovipositor. Weak convex postscutellum developed, showing trace of median incision and micro-rugose. Head almost always with very large facial carina. *Additional characters :* Eyes bare. Parafacials bare. Arista long plumose. Subalar bulla bare. Supra-squamal ridge bare. Lateral declivity of postalar callus densely long haired. Supraspiracular convexity bare. Propleuron and prosternum almost always setulose. Prostigmatic seta present. Prothoracic spiracle always dark brown. Stem-vein of wing bare. Vein *M* bent angularly forwards. Abdominal sternites very broad and exposed, in female almost always with spinous setae and often in male. Male hypopygium as in Calliphorinae.

Immature stages and biology : Almost unknown. Probably larvae parasitic in land snails (Mollusca), females larviparous and retaining larvae in utero to near maturity. Larvae and puparium undescribed.

Distribution (map 2, p.136) : Oriental and Australasian Regions, excluding Tasmania and New Zealand. Eastward distribution ending abruptly at Bismarck Archipelago, absent from Solomon Islands and other Pacific islands. Unknown from Ceylon but possibly occurring there.

Type-genus : *Amenia* Robineau-Desvoidy, 1830.

Ameniidae Brauer and Bergenstamm, 1889, *Denkschr. Akad. Wiss., Wien* **56** : 81, 150, 151. Brauer and Bergenstamm, 1891, *Denkschr. Akad. Wiss., Wien* **58** : 309, 398. Brauer and Bergenstamm, 1893. *Denkschr. Akad. Wiss., Wien* **60** : 109.

AMENIINI Malloch, 1927, *Proc. Linn. Soc. N.S.W.* **52** : 342. Malloch, 1928, *Proc. Linn. Soc. N.S.W.* **53** : 329, 614. Malloch, 1929, *Proc. Linn. Soc. N.S.W.* **54** : 285. Malloch, 1930, *Proc. Linn. Soc. N.S.W.* **55** : 101. van Emden, 1950, *Entomologist's mon. Mag.* **86** : 189, 196. van Emden, 1953, *Entomologist's mon. Mag.* **89** : 120. Paramonov, 1957, *Ann. Mag. nat. Hist.* (12) **10** : 52. [Ameniini + Parameniini] Enderlein, 1936, *Veröff. dtsch.KolonMus. Bremen* **1** : 398, 436, 446.

AMENIINAE Malloch, 1933, *Proc. Linn. Soc. N.S.W.* **58** : 74. Mesnil, 1939, *Essai sur les Tachinaires* : 22, 50. Mesnil *in* Lindner, 1944, *Flieg. Palaearkt. Reg.* 64g : 18, 20. Hardy, 1951, *Entomologist's mon. Mag.* **87** : 96.

Key to the Tribes of AMENIINAE

1 Head with a very strong facial carina separating antennae. Hind tibia with a *pv* apical seta. Outer posthumeral seta* situated mesad of presutural seta (Text-fig. 9) **AMENIINI**

– Head without a facial carina. Hind tibia without a definite *pv* apical seta. Outer posthumeral seta* situated laterad of presutural seta (Text-fig. 10), or sometimes about in line with it . . . . . **PARAMENIINI**

Systematic Treatment

Tribe **AMENIINI** Brauer and Bergenstamm

AMENIIDAE Brauer and Bergenstamm, 1889, *Denkschr. Akad. Wiss., Wien* **56** : 150.

Diagnosis. Ameniinae with following characters : Head with facial carina. Prescutum with outer posthumeral seta situated mesad of presutural seta (Text-fig. 9). Hind tibia with *pv* apical seta. Prosternum and propleuron densely haired (latter occasionally bare in *Stilbomyella*).

Type-genus : *Amenia* Robineau-Desvoidy, 1830.

Twelve described genera belong in the Ameniini but it is concluded from study of the type-species that only five of these can be upheld as valid, viz. *Silbomyia* Macquart, *Platytropesa* Macquart, *Stilbomyella* Malloch, *Amenia* Robineau-Desvoidy, and *Formosiomima* Enderlein. These genera, together with one new genus here described, can be distinguished by the key which follows. The genera *Megaloprepes* and *Spinthemyia* described by Bigot (1859) both have a setulose ventral surface to the second costal sector and other *Silbomyia* characters and are treated in synonymy with this genus ; Enderlein's (1936) genera *Liostiria* and *Doleschallius* are not distinguishable from *Platytropesa* and *Stilbomyella* respectively and are synonymized accordingly ; *Ptylostylum* of Macquart (1851a, b) is an isogenotypic synonym of *Amenia*, and *Neoamenia* Malloch and *Chaetamenia* Enderlein (both with type-species not generically distinguishable from that of *Amenia*) are placed in synonymy with *Amenia*.

* This seta occasionally absent on one or both sides.

The affinities of the recognized genera of Ameniini are discussed under the appropriate generic headings. *Platytropesa* and *Stilbomyella* are superficially similar and future discovery of new species may break down the generic distinction maintained in this paper, but for the present it appears best to treat them as separate genera.

Distribution. Range of tribe coincident with that of Ameniinae as a whole.

Key to the Genera of Ameniini

1 Ventral surface of costa setulose between apices of veins *Sc* and R_1 (Text-fig. 23). Scutellum with a pair of very strong erect spiniform preapical setae, set close together just dorsad of the cruciate apical setae. Fore tibia with two strong *pv* setae (except in *timorensis*). Frons of ♂ very broad and equal in width to that of ♀ ; ♂ always with very strong outer vertical, prevertical and proclinate orbital setae, as in ♀. [Oriental Region except for one species in Queensland]
SILBOMYIA Macquart (p. 50)

– Ventral surface of costa bare between apices of veins *Sc* and R_1 (Text-fig. 22). Scutellum without erect spiniform preapical setae. Fore tibia with one submedian *pv* seta. Frons of ♂ sometimes broad as in ♀, but ♂ eyes often very strongly approximated ; ♂ with or without outer vertical, prevertical and proclinate orbital setae. [Australasian Region] 2

2 Gular region of head strongly swollen, prominent and conspicuous in profile (Text-fig. 24). Hind coxa bare on postero-dorsal surface. Middle part of anterior surface of mid femur with one strong isolated seta. Vibrissae of ♂ inserted level with or slightly below epistomal margin (Text-fig. 13), directed upwards and inwards. ♂ frons broad as in ♀, with outer vertical, prevertical and proclinate orbital setae . . . . . ***PARAPLATYTROPESA*** gen. n. (p. 98)

– Gular region of head normal, not prominently swollen and visible in profile. Hind coxa setulose on postero-dorsal surface externally (bare in some specimens of *Stilbomyella*). Middle part of anterior surface of mid femur almost always with a group of two or more strong setae clearly differentiated. Vibrissae of ♂ inserted well above level of epistomal margin (Text-fig. 14), directed more or less horizontally and crossed. ♂ frons narrower than that of ♀ (except in *Platytropesa*), although eyes not always strongly approximated, ♂ usually without outer vertical, prevertical or proclinate orbital setae 3

3 Fore tibia with two or three small but distinct *pd* setae (Text-fig. 11). Facial ridges with fine setulae extending more than half way (♂) or about half way (♀) up their length, in profile reaching far beyond level of apex of antenna. Frons about equal in width in both sexes. ♂ with outer vertical, prevertical and sometimes proclinate orbital setae. Facial carina very strikingly sexually dimorphic, very enlarged (Text-fig. 14) in ♂ with anterior surface flattened and sides pinched-in towards one another. Antennae elongate and in deep foveae, much longer in both sexes than width of gena . . . ***PLATYTROPESA*** Macquart (p. 84)

– Fore tibia without *pd* setae (Text-fig. 12). Fine hairs above vibrissae confined to lower quarter of each facial ridge, in profile only extending at most a little beyond apex of antenna. Frons narrower in ♂ than ♀, ♂ eyes often very strongly approximated and frons reduced. ♂ without prevertical and proclinate orbital setae, almost always without definite outer vertical setae. Facial carina not noticeably sexually dimorphic. Antennae short and usually in shallow foveae, usually not much longer than width of gena 4

4 Mesonotum entirely metallic, without marginal white spots. Body form distinctly elongate, abdomen ovate and in mid line as long as or longer than greatest breadth (Text-fig. 26). Cross-vein *r–m* situated almost exactly at middle of discal cell. Setae of head and mesonotum strongly developed. Anterior margin of wing broadly dark brown infuscate, infuscation extending posteriorly to vein R_{4+5}. Interfrontal area, facialia, antennal foveae and antennae black-brown or dark reddish-brown. [Moluccas, New Guinea and New Britain]

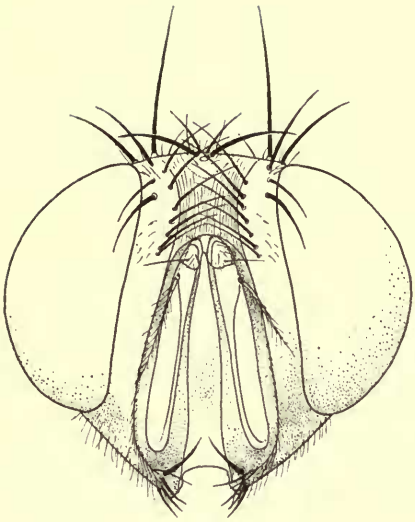
STILBOMYELLA Malloch (p. 93)

– Mesonotum with three pairs of large white-pollinose marginal spots. Body form short and broad, abdomen subquadrate and by measurement shorter in mid line than its greatest breadth (Text-fig. 25). Cross-vein *r–m* situated well before middle of discal cell, distance from *r–m* to *m–cu* 1·3–1·7 times as great as that between *r–m* and basal cell. Setae of head and mesonotum usually fine and weak, those of frons often mostly hair-like. Wing clear hyaline except for dark brown infuscation at extreme base over basal cells. Interfrontal area, facialia, antennal foveae and antennae (except rarely for basal segments) yellow or orange. [Australia only] 5

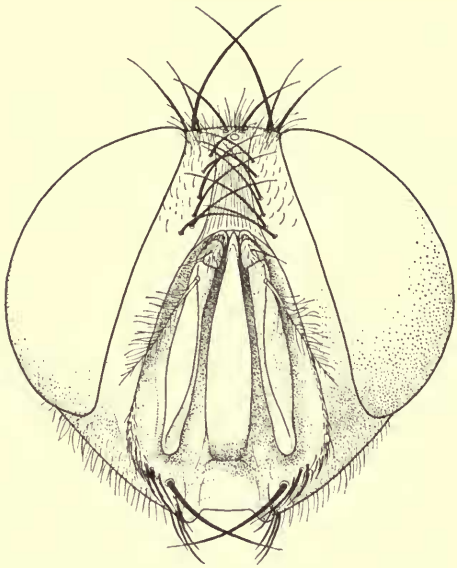
5 Abdominal T4 with a regular row of almost evenly spaced marginal setae. Sutures between abdominal tergites normal, fully formed. Sternites with strong setae, often distinctly spiniform. Scutum without submedian white spots. Abdomen predominantly metallic with white pollinose areas or spots

AMENIA Robineau-Desvoidy (p. 100)

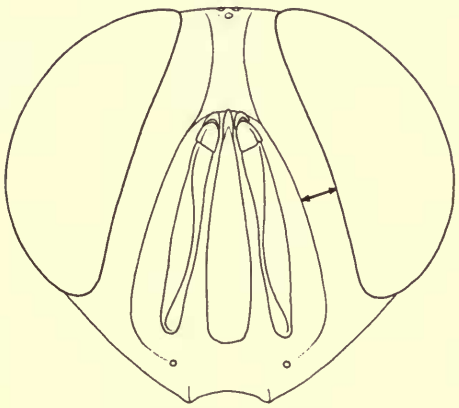
– Marginal setae of T4 not forming a regular transverse row, arranged in widely spaced pairs with each pair standing on a large black spot (Text-fig. 27). Abdominal tergites partially fused, sutures between hindmost visible tergites indistinct and without breaks in dense pollen cover. Sternites without strong setae but with moderately long strong hair. Scutum with a pair of large submedian white spots. Abdomen predominantly and thickly pale pollinose with a pattern of bold black spots (Text-fig. 27) . . . . ***FORMOSIOMIMA*** Enderlein (p. 122)



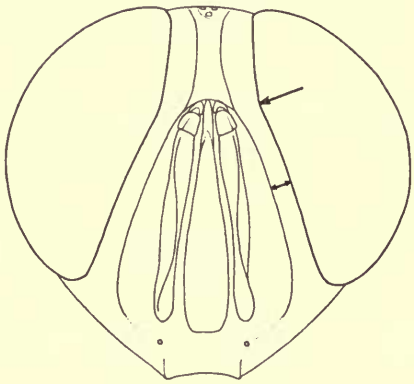
13



14



15



16

FIGS. 13–16. Figs. 13 and 14. Facial view of head of (13) ♂ *Paraplatytropesa* gen. n., and of (14) ♂ *Platytropesa* Macquart, latter drawn from specimen without proclinate orbital setae. Figs. 15 and 16. Facial outlines of head structure in (15) *Platytropesa simulans* sp. n. and (16) *Platytropesa auriceps* Macquart, latter with inner eye margin angulate at point indicated by arrow.

SILBOMYIA Macquart, 1843

Silbomyia Macquart, 1843, *Mém. Soc. Sci. Lille*, Année 1842 : 274. *Diptères Exot.*, **2**, pt. 3 : 117. Type-species : *Musca fuscipennis* Fabricius, 1805, by subsequent designation of Engel (1925).

Stilbomyia Agassiz, 1846, *Nomen. Zool. Index Univ.* : 353. [Unjustified emendation of *Silbomyia* Macquart ; see Articles 32 and 33 of *International Code of Zoological Nomenclature*, 1961.]

Megaloprepes Bigot, 1859, *Rev. Mag. Zool.* (2) **11** : 309. Type-species : *Megaloprepes albonotatus* Bigot, 1859, by monotypy. **syn. n.**

Spinthemyia Bigot, 1859, *Rev. Mag. Zool.* (2) **11** : 309. Type-species : *Spinthemyia fulgida* Bigot, 1859, by monotypy.

Diagnosis. Ventral surface of costa setulose between apices of veins *Sc* and R_1 (second costal sector). Frons very broad and equal in both sexes, ♂ eyes not at all approximated. ♂ with strong outer vertical setae and two pairs of strong proclinate orbital setae as in ♀. Sternites 2–4 in both sexes with strong spinous setae, these sternites in ♂ never with very long dense hair.

Discussion. For the past century this genus has usually been referred to (Brauer and Bergenstamm, 1889 ; Wulp, 1896 ; Engel, 1925 ; Malloch, 1927, 1928a, 1928b, 1929, 1930, 1935 ; Enderlein, 1936 ; Paramonov, 1957) by the name *Stilbomyia*, an emendation of *Silbomyia* attributable to Agassiz (1846) ; in recent years only Townsend (1931, 1935, 1937) has followed the original spelling.

Macquart erected the genus *Silbomyia* for *Musca fuscipennis* and *Musca micans* of Fabricius (1805). The former is type-species of the genus by designation of Engel (1925), not by designation of Brauer and Bergenstamm (1889) as given by Townsend (1937, p. 172) : *fuscipennis* Fabricius is cited by Brauer and Bergenstamm (*op. cit.*) as an *example* of *Silbomyia* and their citation is therefore not acceptable as a fixation of the type-species in view of Opinion 98 (Brauer and Bergenstamm) rendered by the International Commission on Zoological Nomenclature. Engel's (1925) citation of *fuscipennis* Fabricius as type-species is the earliest acceptable type-fixation for *Silbomyia* Macquart.

Engel (1925), who did not see the Fabricius types (now in the Universitetets Zoologiske Museum, Copenhagen), considered *micans* Fabricius and *fuscipennis* Fabricius to be synonymous, but Townsend (1931) has correctly pointed out that Engel was mistaken. The ♂ holotype of *Musca micans* Fabricius lacks the facial carina and other *Silbomyia* characters, and Townsend (1931) was correct in assigning *micans* to the genus *Catapicephala* Macquart ; this genus does not belong in the Ameniinae and *micans* is therefore excluded from consideration in this paper.

Bigot (1859) erected the genera *Megaloprepes* and *Spinthemyia*, both monotypic for new species from Celebes, viz. *M. albonotatus* Bigot and *S. fulgida* Bigot respectively. Townsend (1937, p. 153 and p. 172) has stated that the types of these species are lost, but the types of both from the Bigot collection are in the British Museum. Brauer (1898) recorded seeing *S. fulgida* in his account of the Bigot types (" Originalexemplaren "), and the specimen he saw (now in B.M. Nat. Hist.) is labelled " Type " and " Brauer WIEN CVII (No. 123) ", the number being the serial number of *fulgida* in Brauer's paper : this specimen is undoubtedly the holotype of *S. fulgida*

Bigot. Brauer's papers on the Bigot's types omit any mention of *Megaloprepes albonotatus* and this is probably the basis for Townsend's assumption that the type is lost, but there are three specimens from Celebes in the British Museum collection which were formerly part of Bigot's collection and which were presented to the B.M. Nat. Hist. by the late G. H. Verrall in 1904 ; these specimens agree fully with Bigot's description of *Megaloprepes albonotatus* and there are no other specimens in the entire Bigot collection (which is now in the B.M. Nat. Hist.) which could in any way fit his description of *Megaloprepes*. I therefore consider it justified to regard these three specimens from the Bigot collection, since they are from Celebes and exactly fit the description, as the original type material and to designate a lectotype from them accordingly.

The holotype of *Spinthemyia fulgida* Bigot and the lectotype of *Megaloprepes albonotatus* Bigot are in my view congeneric with *Silbomyia fuscipennis* (Fabricius), type-species of *Silbomyia*, and *Megaloprepes* and *Spinthemyia* are here treated as synonyms of *Silbomyia*.

Silbomyia Macquart is easily distinguished from other genera of the Ameniini by the setulose ventral surface of the costa between the apices of veins *Sc* and R_1. This character (Text-fig. 23) at once easily distinguishes *Silbomyia* from *Amenia* Robineau-Desvoidy, genera which Paramonov (1957) suggests are not convincingly separable on real taxonomic grounds. However almost all the species placed in *Silbomyia* by Paramonov (1957), and previously by Malloch (1927, 1930), and occurring in Australia are not true *Silbomyia*, since they have the second costal sector bare on the ventral surface and lack other characters of *Silbomyia* ; *S. minor* Malloch is the only known species of *Silbomyia* occurring in Australia, the other Australian species previously included in this genus belonging in *Platytropesa* Macquart or *Stilbomyella* Malloch.

The species of *Silbomyia* show an extremely close uniformity, which extends to the male genitalia ; these are more or less indistinguishable even in species which are obviously distinct on other characters. The species differ mainly in the proportions of the head structures, particularly the relative widths of the parafrontals and interfrontal area and in the size and shape of the frontal carina ; these characters are clearly very constant and certainly provide good specific criteria. In this work fifteen species are recognized, of which seven are described as new ; ten previously described species belong in *Silbomyia* of which eight are upheld as good species, two names falling in synonymy. *S. hoeneana* Enderlein from China and *S. sauteri* Enderlein from Formosa are extremely close and may prove to be identical, but for the present there is insufficient evidence on which to synonymize these names.

Wulp (1896) placed twelve names under *Silbomyia*, but only four of these are truly assignable to this genus (*fuscipennis* Fabricius, *fulgida* Bigot, *prospera* Walker, *nitidissima* Vollenhoven) ; of the other eight names, five belong in the Ameniinae in *Platytropesa* and *Stilbomyella* and are dealt with later in this paper. The remaining three species are not Ameniinae at all and belong as follows : *micans* Fabricius in *Catapicephala* Macquart ; *infixa* Walker and *fumipennis* Walker in *Hypopygiopsis* Townsend. These last three names also appear under *Silbomyia* in Bigot's (1892)

catalogue of Oriental Diptera. Both Wulp (1896) and Engel (1925) were in error in treating *prospera* Walker and *nitidissima* Vollenhoven as synonyms of *fulgida* Bigot ; they are both synonymous with *albonotata* Bigot, not with *fulgida*.

Attention should be drawn here to confusion existing among the syntypes of *S. latigena* Enderlein and *S. sauteri* Enderlein, type-material of which is mainly in the Deutsches Entomologisches Institut, but some also in the Zoologisches Museum der Humboldt-Universität and in the British Museum (Natural History). Enderlein (1936) described these species from a long series of specimens collected by H. Sauter in Formosa, applying the name *S. latigena* to a species with a yellow postocular area (" Schlafen lebhaft goldgelb ") and the name *S. sauteri* to another with a silvery postocular area (" Schlafen . . . silberweiss "). He described in addition *S. sauteri* var. *viridis* Enderlein for green, instead of the typical violet or dark blue, specimens of *sauteri*. All the type-material of both species, consisting in all of 58 specimens, has been examined and it is clear that two closely allied species are involved which differ considerably in the structure and proportions of the facial carina ; in one the carina (especially in the male) is long, narrow and somewhat " pinched-in " and in the other is broader, forming a more distinct ridge, and not at all pinched in. Forms with the long narrow carina have a yellow or at least silvery-yellow postocular area and it is clear, although Enderlein did not mention the carina character, that the name *latigena* Enderlein applies to this species ; the name *sauteri* applies to the species with short carina and silver postocular area. Lectotypes have been designated to fix these names.

Enderlein did not designate a holotype for either species, but labelled a number of each as " type " and a number of other specimens of each species as " cotype ". Unfortunately he did not correctly segregate the two species, and as a result seven specimens labelled as types or cotypes of *S. sauteri* End., and three specimens labelled as types and cotype of *sauteri* var. *viridis* End. are actually specimens of *S. latigena* End. and not of *sauteri*! A determination label has been affixed to each of these specimens identifying it as *latigena* with the additional words " labelled as *sauteri* in error by Enderlein ". Almost all the types of the two species agree with the data published by Enderlein, but there are a few slight discrepancies ; nonetheless it appears justifiable to consider all the specimens actually labelled by Enderlein, whether described as a type or a cotype, as forming the syntypic series. The specimens chosen as lectotypes of the two species conform fully with the information published with the original descriptions, and each correctly labelled syntype remaining after lectotype selection has been labelled as a paralectotype. It should be noted that the specimens of *S. latigena* erroneously labelled by Enderlein as *sauteri* are nonetheless paralectotypes of *sauteri* although actually belonging to the other species. In addition to the syntypic material of *S. latigena* and *S. sauteri* bearing Enderlein's labels I have seen a further long series of specimens from the Sauter collection which have very similar or identical data with that on the syntypes but have not been labelled by Enderlein ; there is no evidence that these additional specimens were seen by Enderlein and I am therefore not regarding them as forming part of the syntypic series.

Distribution : *Silbomyia*, except for a single species from northern Queensland, is an entirely Asiatic genus and the only genus of Ameniini occurring in the Oriental Region (map 1). The genus is widely distributed from India eastwards through China to Formosa, and south-eastwards through the Malay peninsula to eastern Indonesia and the Philippines. In Indonesia the eastern limit of distribution is in Celebes (where two species occur that are found nowhere else) and Timor ; so far as is known at present true *Silbomyia* is absent from the Molucca Islands, Aru and New Guinea, where the closely related genera *Platytropesa* and *Stilbomyella* occur. The last two genera do not occur west of the Moluccas, and in eastern Indonesia there is therefore no area of overlap between *Platytropesa* and *Silbomyia* ; in Queensland however *Silbomyia minor* Malloch occurs together with a species of *Platytropesa*. The occurrence of this one species of *Silbomyia* in Australia is puzzling, for it appears to be widely isolated from Timor and Celebes, the nearest known areas where *Silbomyia* occurs. The complete absence of *Silbomyia* from New Guinea makes it appear probable that *Silbomyia* reached Queensland by a route from Timor through Northern Australia rather than through New Guinea (whence, on the other hand, *Platytropesa* almost certainly reached Australia) ; no *Silbomyia* are yet known from the Northern Territory of Australia but it is likely that the genus occurs there.

The evidence so far available suggests that each major island of the East Indian archipelago possesses a species of *Silbomyia* which is endemic on that island and occurs nowhere else or only on other very nearby islands : thus *S. fuscipennis* (Fabricius) is confined to Java and Sumatra, *S. sumba* sp. n. to Sumba, *S. metallica* sp. n. to Borneo, *S. palawana* sp. n. to Palawan, and *S. philippinensis* to the Philippine Islands other than Palawan. Two species, *S. albonotata* (Bigot) and *S. fulgida* (Bigot), are confined to Celebes.

Key to the Species

1 Genal hair black. Upper parts of parafrontals dark metallic brassy green or violaceous, strongly contrasting in colour with whitish pollinose lower parts of parafrontals. Facial carina, antennal foveae, epistome and third antennal segment entirely or largely pale brown or blackish brown 2

– Genal hair pale to golden yellow. Parafrontals all yellowish, upper parts not dark metallic and with yellow ground colour. Facial carina, antennal foveae, epistome and third antennal segment pale yellow or orange 3

2 Interfrontal area twice as wide as a parafrontal. Mesonotum all brilliantly metallic, non-pollinose. Wings uniformly dark brown. Abdominal T3 without discal setae. ♂ third antennal segment 6·0 times as long as second segment and facial carina 4·1–4·7 times as long as epistome. [Celebes] ***S. albonotata*** (Bigot) (p. 56)

– Interfrontal area narrow, at narrowest point no wider than a parafrontal. Mesonotum thinly white pollinose on prescutum, notopleura and areas of supra-alar setae. Wings not evenly dark brown, the infuscation heavier near the veins than elsewhere. Abdominal T3 with discal setae. ♂ third antennal segment 3·3–3·7 times as long as second segment and facial carina 2·8–3·4 times as long as epistome. [Philippine Islands] . . . . . ***S. philippinensis*** sp. n. (p. 58)

3 Postorbits entirely pollinose, upper ends at most only appearing slightly shining in some lights. Mesonotum whitish pollinose marginally, pollinosity most conspicuous seen from behind. Interfrontal area dull, without a sheen. Wings with dark brown infuscation heaviest along the veins, or dark brown anteriorly and evenly fading to clear hyaline posteriorly (except in *fuscipennis*). [Not from Celebes] 4

– Upper ends of postorbits bare shining metallic dark greenish or purplish black. Entire mesonotum brilliantly metallic, no pollinosity visible in any light. Interfrontal area with characteristic golden sheen. Wings uniformly dark brown. [Celebes] . . . . . ***S. fulgida*** (Bigot) (p. 60)

4 Abdominal tergite 1+2 with a pair of strong median marginal setae . . . 5

– Abdominal tergite 1+2 without median marginal setae 6

5 Upper occiput thickly pale yellow pollinose, not at all metallic. Postorbits pale yellow pollinose. Hair of lower parts of parafrontals pale yellow. Interfrontal area 3·2 times as wide as a parafrontal. Seta on second antennal segment fine and weak, much shorter than arista. [Sumba] . . ***S. sumba*** sp. n. (p. 62)

– Upper occiput greenish metallic in most lights, only thinly whitish pollinose. Postorbits silvery white pollinose. Parafrontal hair all black. Interfrontal area 2·3 times as wide as a parafrontal. Seta on second antennal segment very strong, as long as arista. [Palawan Island] . . . ***S. palawana*** sp. n. (p. 63)

6 Gena exceptionally broad, about four-ninths or almost one-half (0·43–0·49) of eye-height. Head very strikingly sexually dimorphic (♂ not known in *minor* but this character almost certain to hold true for this species). Wings largely clear hyaline, only infuscate antero-basally. Very small species, length 6·6–9·9 mm. 7

– Gena narrow, at most just over one-third (0·35) of eye-height. Head not or only slightly sexually dimorphic. Wings evenly dark brown infuscate or infuscation heaviest along veins, largely clear hyaline only in *timorensis*. Larger species, length almost always more than 11 mm. 8

7 Upper occiput thickly white pollinose, not appearing at all metallic in any light. White pollinosity on prescutum very conspicuous, extending back to and ending abruptly at transverse suture. Dorsum of T3 with conspicuous white pollinosity. Third antennal segment of ♀ 3·5 times as long as second segment. Antennae in ♂ inserted far above level of eye middle, extremely elongate, third segment 7·5 times as long as second segment. ♂ facial carina over one and a half times as long as distance from lunula to anterior ocellus. Length 8·9–9·9 mm. [India] ***S. parvula*** Baranov (p. 64)

– Upper occiput very thinly whitish pollinose, appearing dark greenish metallic in most lights. White pollinosity on prescutum only very inconspicuous near anterior margin and disappearing well before transverse suture. Dorsum of T3 without conspicuous white pollinosity. Third antennal segment of ♀ elongate, 4·7 times as long as second segment. ♂ unknown. Length 6·6 mm. [Queensland] ***S. minor*** Malloch (p. 66)

8 Fore tibia with two strong *pv* setae. Wings dark brown infuscate, either evenly or infuscation heaviest along veins. [Not from Timor] 9

– Fore tibia with only one *pv* seta. Wings dark brown only antero-basally, remainder of wings almost clear. [Timor] . . . ***S. timorensis*** sp. n. (p. 67)

9 Wings very uniformly dark brown, infuscation not concentrated along veins or weaker in cells. Bend of vein *M* unusually remote from wing margin, distance from bend to margin at least 3·1 times as great as that between *m–cu* and bend. [Sumatra to Lombok] 10

– Wings with dark brown infuscation most concentrated along veins and paler in cells, not evenly darkened. Bend of vein *M* nearer to wing margin, distance from bend to margin not more than twice that between *m–cu* and bend. [Not from Sumatra to Lombok] 11

10 Postorbits pale to golden yellow. Veins R_{2+3} and R_{4+5} unusually strongly bowed forwards (Text-fig. 18), cell R_1 therefore very strongly tapering apically. Distance from bend of vein *M* to wing margin 3·5–4·0 times as great as that between *m–cu* and bend. Antennae elongate, third segment 4·5 times as long as second segment in ♀ and 6·2 times as long in ♂ ; facial carina correspondingly elongate, 4·5 times as long as epistome in ♀ and 6·2–6·6 times as long in ♂. [Java and Sumatra]
S. fuscipennis (Fabricius) (p. 68)

– Postorbits silvery whitish. Veins R_{2+3} and R_{4+5} not strongly bowed forwards, cell R_1 broader and less strongly tapering. Distance from bend of vein *M* to wing margin 3·1 times as great as that between *m–cu* and bend. Antennae shorter, third segment 3·2 times as long as second segment in ♀ (not known for ♂) ; facial carina shorter, 2·7 times as long as epistome in ♀ (not known for ♂). [Lombok]
S. mackerrasi sp. n. (p. 72)

11 Facial carina longer and distinctly fusiform, especially in ♂, its lateral surfaces pinched in towards one another and anterior surface not forming a definite median ridge, carina 3·5–4·2 times as long as epistome in ♂ and 2·9–3·3 times as long in ♀, in both sexes slightly longer than distance from lunula to anterior ocellus. Antennae longer in ♂ than ♀, third segment in ♂ 4·4–4·6 times as long as second segment. Postorbits yellow in ♀, more silvery yellow in ♂
S. latigena Enderlein (p. 73)

– Facial carina short, broader and more keel-like, usually forming a definite median ridge on anterior surface, shorter than distance from lunula to anterior ocellus and not more than 3·3 times as long as epistome in either sex. Antennae about equal in length in both sexes, third segment not more than 3·9 times as long as second segment. Postorbits silvery white 12

12 Margin of lower calypter dark brown. Interfrontal area very broad, 3·3–3·6 times as wide as a parafrontal. Vertex by measurement distinctly broader than one eye viewed from above, eye-vertex-eye ratio about 5 : 7 : 5 13

– Margin of lower calypter white. Interfrontal area 1·4–2·8 times as wide as a parafrontal. Vertex by measurement almost exactly equal in width to one eye viewed from above 41

13 One or both of abdominal tergites 3 and 4 almost always with median discal setae among the spiniform hair. ♂ third antennal segment 3·4–3·5 times as long as second segment. Colour usually dark blue to violet, only occasionally green. [Formosa] . . . . . ***S. sauteri*** Enderlein (p. 76)

– Tergites 3 and 4 always without discal setae. ♂ third antennal segment longer, 3·7–3·9 times as long as second segment (difference possibly not constant). Colour almost always green. [China] . . . . . ***S. hoeneana*** Enderlein (p. 78)

14 Interfrontal area 2·4–2·8 times as wide as a parafrontal. Parafacials yellowish white pollinose and in some lights having a brilliant creamy white or slightly silvery appearance. [India to Malaya] . . . . . ***S. asiatica*** sp. n. (p. 80)

– Interfrontal area unusually narrow, 1·4–1·7 times as wide as a parafrontal, the parafrontals correspondingly broad. Parafacials golden yellow pollinose, not appearing brilliant whitish in any light. [Borneo] . ***S. metallica*** sp. n. (p.81)

Descriptions of the Species

Silbomyia albonotata (Bigot, 1859) **comb. n.**

(Text-figs. 32, 35)

Megaloprepes albonotatus Bigot, 1859, *Rev. Mag. Zool.* Ser. 2, **11** : 309. Lectotype ♂, CELEBES. In the British Museum (Natural History), London.

Musca prospera Walker, 1860, *J. Linn. Soc. Lond.* (*Zool.*) **4** : 133. Lectotype ♀, CELEBES. In the British Museum (Natural History), London. **syn. n.**

Silbomyia nitidissima Vollenhoven, 1863, *Versl. med. K. Akad. wetensch. Amst.* **15** : 16. Lectotype ♂, CELEBES. In the Rijksmuseum van Natuurlijke Historie, Leiden. **syn. n.**

Lectotype Designations : (1) *Megaloprepes albonotatus* Bigot. The British Museum collection contains three specimens from the Bigot collection labelled Celebes and agreeing perfectly with the original description. None of the specimens bears the name ' albonotatus ' in Bigot's writing, but there is no doubt that these specimens represent the original syntypic series, and a ♂ syntype has been labelled and is here designated as lectotype. The remaining two syntypes have been labelled as paralectotypes.

(2) *Musca prospera* Walker. Walker (1860a) gave a basic description of this species, followed by a brief description of two varieties, " Var. β." and " Var. γ.". These varietal names, being written in the form of single letters, do not have availability (Article 11 (g)(i) of present *Code*) and the specimens on which they are based must therefore be treated as part of the syntype series of *prospera*. The British Museum collection contains two ♀ specimens labelled ' prospera ' in Walker's writing and agreeing fully with his basic description ; one of these has been labelled and is here designated as lectotype. In addition the B.M. contains a ♀ specimen with the same data as the lectotype which agrees perfectly with Walker's description of " Var. γ.", and which must certainly be the specimen Walker had before him when describing this variety : this specimen is not conspecific with the other syntypes of *prospera*, and belongs to the related *S. fulgida* (Bigot) from Celebes. The Oxford University Museum contains a specimen of *prospera* bearing a circular faded blue label reading ' Mak.' identical with a label on the lectotype specimen ; the characters of this specimen fit exactly with Walker's " Var. β." and there seems no doubt that the Oxford specimen was one that Walker had before him at the time of the original description, and must be treated as one of the syntype series. The syntype in Oxford is labelled " Silbomyia prospera Walk, Makassar, Wallace, E Mus Saund. 1867 10d " ; probably in Westwood's writing, and the date and price refer to a transaction in which the specimen changed hands. The three syntypes remaining after lectotype designation have been labelled as paralectotypes.

(3) *Silbomyia nitidissima* Vollenhoven. Described from four specimens from Tondano, stated by Vollenhoven (1863) to be all ♀. The four syntypes are in Rijksmus. Leiden, and three of them are in fact ♂ ; one of the ♂ syntypes has been labelled and is here designated as lectotype, and the remaining syntypes have been labelled as paralectotypes.

DIAGNOSIS. T1+2 with median marginal setae ; genal hair black ; wings uniformly dark brown ; bristle on second antennal segment short and weak.

♂. *Head :* Interfrontal area orange-brown or reddish brown ; area of ocelli and upper halves of parafrontals metallic, dark brassy green occasionally with violaceous reflections ; parafrontals just below metallic areas with blackish ground colour and white pollinosity ; remainder of parafrontals and all of parafacials with pale yellow ground colour and dense white or creamy white pollinosity ; facial carina, antennal foveae and epistome blackish brown or dark reddish brown with very thin inconspicuous greyish pollinosity, pollen on mid line of facial carina a little more yellowish ; genae with dark brownish ground colour and very thin inconspicuous whitish pollinosity, in some lights appearing very slightly metallic greenish or purplish ; postorbits silvery white pollinose except on uppermost parts near the vertex which are dark greenish metallic. Hair of parafrontals and genae entirely black. Upper occiput cupreous to violaceous green, shining, very little trace of pollinosity ; cerebrale brownish yellow. Eye-vertex-eye ratio about 12 : 13 : 12. Interfrontal area about twice (1·9–2·1) as wide as a parafrontal. Facial carina long and narrow, rather pinched in laterally and slightly fusiform in general shape, about 1·4 times as long as distance from lunula to anterior ocellus and 4·1–4·7 times as long as epistome. Gena exceptionally narrow, about one-ninth to one-eighth (0·11–0·125) of eye-height. Parafacial 1·5–1·75 times as wide as third antennal segment ; facial ridges almost straight in profile, fine hairs above the vibrissae reaching about half way up the ridges. Postocellar setae well developed. Antennae brown or blackish brown except for small dark orange area at extreme base of third segment, third segment very long and some 6·0 times as long as second segment ; seta on second segment shorter than arista, usually rather weak ; arista about equal in length to third antennal segment. Palpi brownish yellow. *Thorax :* entire dorsum brilliantly metallic emerald or cupreous green without trace of pollinosity ; mesopleura and sternopleura green, each with a very large spot of dense white pollinosity conspicuous only when viewed from above, in other lights the area of the pollinose spots appearing bluish violet ; pteropleura and hypopleura reddish or violaceous. *Wings :* uniformly dark brown. Distance between bend of vein *M* and wing margin 1·7–2·2 times as great as that between *m–cu* and the bend ; on vein *M* distance from *r–m* to *m–cu* 2·8–3·3 times that between *m–cu* and bend ; veins R_{2+3} and R_{4+5} not bowed forwards. Costal spine minute. Margin of lower calypter dark brown, calyptrae otherwise white. *Legs :* black, femora with violaceous reflections and fore coxae often somewhat greenish. *Abdomen :* dorsum brilliant metallic emerald or cupreous green, apex more violaceous when seen from behind ; venter reddish violaceous to deep violet and contrasting with green dorsum. T5 on each side with a large spot of dense white pollinosity easily visible to naked eye, these pollinose areas mainly ventro-lateral in position but extending slightly on to dorsum of tergite ; T3 when viewed from behind showing trace of an extremely thin covering of whitish pollinosity, this pollinosity extending medially round the sides of the tergite and becoming slightly more conspicuous on latero-ventral surface especially when seen from above. T1+2 with a pair of very strong median marginal setae which are occasionally duplicated on one or both sides ; T3 consistently with only one lateral marginal seta on each side ; T3 and T4 without median discal setae. Hair of T3 and T4 recumbent, except as a rule for some semi-erect hair in mid-line of T3 ; hair of T5 short, fine and erect. ♂ hypopygium as in Text-figs. 32 and 35. *Measurements :* body length 15·5 mm. (range 14·4–16·3 mm.), wing length 12·9 mm. (range 11·8–13·7 mm.) [10 specimens].

♀. Extremely like ♂ except for following detail of the head : facial carina not at all fusiform and laterally compressed, more ridge-like and broader ventrally, 3·6–3·8 times as long as epistome ; third antennal segment shorter, 4·7–5·1 times as long as second segment ; parafacials broader, each about 2·75–3·0 times as wide as third antennal segment ; gena broader, almost one-fifth of eye-height. On abdominal T3 there are sometimes two pairs of strong median marginal setae, always only one in ♂. *Measurements* : body length 15·4 mm. (range 13·7–17·9 mm.), wing length 12·6 mm. (range 11·3–14·3 mm.) [10 specimens].

Material examined. *Megaloprepes albonotatus* Bigot, ♂ lectotype and 1 ♂, 1 ♀, paralectotypes, Celebes (no other data) (B.M. Nat. Hist.). *Musca prospera* Walker, lectotype ♂, Celebes : Macassar (*A. R. Wallace*) ; paralectotypes : Celebes : 1 ♀, Macassar, 1857–58 (*A. R. Wallace*) (B.M. Nat. Hist.), and 1 ♂, Macassar (*Wallace*) (Oxfd. Univ. Mus.). *Silbomyia nitidissima* Vollenhoven, ♂ lectotype and 2 ♂♂, 1 ♀, paralectotypes, Celebes : Tondano (*Forsten*) (Rijksmus. Leiden).

Indonesia. Celebes : 1 ♂ (*Westerm.*) (Zool. Mus. Humb. Univ.) ; 2 ♂♂, 1 ♀, Menado (*Mme. Ida Pfeiffer*) (B. M. Nat. Hist.) ; 1 ♂, Nord-Ost Celebes, Minahassa (*v. Röder*) (Staatl. Mus. Stuttgart) ; 1 ♀, S. Celebes, Samanga, xi.1895 (*H. Fruhstorfer*) (Zool. Mus. Humb. Univ.) ; 1 ♂, 1 ♀, Nord Celebes, Toli-Toli, xi-xii.1895 (*H. Fruhstorfer*) (Zool. Mus. Humb. Univ. & B. M. Nat. Hist.) ; 1 ♀, S. Celebes, Lampa-Battau, 3,000 ft., iii.1896 (*H. Fruhstorfer*) (B. M. Nat. Hist.) ; 2 ♀♀, Latimodjonggeb-Uru, 800 m., viii-ix.1930 (*G. Heinrich*) (B. M. Nat. Hist. & Zool. Mus. Humb. Univ.) ; 1 ♂, 1 ♀, Bantimoeroeng, 25.v.1930 (*G. Heinrich*) (Zool. Mus. Humb. Univ.) ; 1 ♂, 1 ♀, Bantimoeroeng, viii.1931 (*G. Heinrich*) (Zool. Mus. Humb. Univ. & B. M. Nat. Hist.) ; 1 ♀, Bonthain, Wawa Karaeng, 1,100 m., viii.1931 (*G. Heinrich*) (Zool. Mus. Humb. Univ.) ; 1 ♀, Bontham, Wawa Karaeng, ix-x.1931 (*G. Heinrich*) (B. M. Nat. Hist.) ; 1 ♀, Ile-Ile, 500–800 m., xii.1930 (*G. Heinrich*) (Zool. Mus. Humb. Univ.) ; 2 ♀♀, N. Celebes, Rurukan, 900 m., i.1931 (*G. Heinrich*) (Zool. Mus. Humb. Univ. and Staatl. Mus. Stuttgart) ; 1 ♀, Enrekang, 5.ix.1930 (*G. Heinrich*) (Zool. Mus. Humb. Univ.) ; 1 ♂, Minahassa, Tomohon, 30.v.–2.vi.1954 (*A. H. G. Alston*) (B. M. Nat. Hist.) ; 1 ♂, Tondano (*Forster*) (Rijksmus, Leiden).

Distribution : Confined to Celebes, where it occurs together with *S. fulgida* (Bigot). Enderlein (1936, p. 440) has referred to some of the material listed above under the name *S. prospera* (Walker).

Affinities. Allied to *S. philippinensis* sp. n. but easily distinguished by the characters given in the key ; also showing fairly close affinity with *S. fulgida* (Bigot) but readily differentiated from this species by the dark brown face and antennae, dark green metallic upper parafrontals, black-haired genae and proportions of head structures.

Silbomyia philippinensis sp. n.

Diagnosis. Genal hair black ; upper parafrontals dark metallic greenish to violet ; interfrontal area at narrowest equal in width to or only a little wider than parafrontal at its broadest ; dorsum of thorax pollinose marginally.

♂. *Head :* Interfrontal area reddish brown ; ocellar area metallic greenish or greenish violet ; upper parts of parafrontals from level of lower proclinate orbital setae to vertex dark metallic green to violet in colour and without pollinosity, contrasting with creamy whitish pollinose lower parts of parafrontals ; lower halves of parafrontals and all of parafacials pale yellow in ground colour and densely yellowish white or creamy yellowish pollinose ; facial carina, antennal foveae and epistome brown or pale brown at least in part (facial carina and part of epistome sometimes yellowish), with thin inconspicuous whitish pollinosity ; genae variable

in material seen, colour ranging from yellow with golden pollinosity to dark slightly metallic violaceous with whitish pollen ; postorbits densely white or yellowish white pollinose, the pollinosity extending dorsally more or less to the outer vertical setae. Hair of parafrontals and genae entirely black. Upper occiput slightly metallic dark green or violet, metallic appearance slightly obscured by thin white pollinosity more obvious in some lights than others ; cerebrale semi-translucent orange medially but slightly metallic blackish green or violaceous laterally. Vertex seen from above obviously narrower than one eye, eye-vertex-eye ratio about 6 : 5 : 6. Interfrontal area at its narrowest point equal in width or only very slightly broader (1·2 times as wide) than one parafrontal at the corresponding point, parafrontals therefore unusually broad in relation to the interfrontal area. Facial carina short and rather ridge-like, not fusiform or noticeably laterally compressed, about equal in length to distance from lunula to anterior ocellus and about 2·8–3·4 times as long as epistome. Gena about one-seventh (0·14–0·15) of eye-height. Parafacial 2·5 times as wide as third antennal segment. Fine hairs above vibrissae reaching at most only one third of way up facial ridges. Postocellar setae fine and weak, sometimes only minute hairs. Antennae brown except for extreme base of third segment narrowly orange, third segment 3·3–3·7 times as long as second segment ; bristle on second segment exceptionally long and strong, as long as or even longer than entire antenna ; arista equal in length to third antennal segment. Palpi yellow or brownish yellow. *Thorax :* dorsum varying from bluish green occasionally with small violaceous patches to deep bluish violet (as in holotype), the prescutum, notopleura and areas of supra-alar setae with a covering of white pollinosity which is most easily seen in posterior view ; sides of thorax mostly bluish green, the mesopleura and sternopleura with the usual very large densely white pollinose spots ; hypopleura and posterior parts of pteropleura reddish brown with metallic reddish violaceous reflections. *Wings :* with heavy brown infuscation broadly along the veins, darkening appearing most concentrated anteriorly where the veins are close together, wing membrane very pale brownish in cells and along hind margin. Distance between bend of vein *M* and wing margin 1·6–1·8 times as great as that between *m–cu* and bend ; on vein *M* distance from *r–m* to *m–cu* 2·7–3·3 times that between *m–cu* and bend. Costal spine short and inconspicuous, shorter than *r–m*. Margin of lower calypter dark brown, calyptrae otherwise white. *Legs :* black, femora with bluish green to violaceous metallic reflections. *Abdomen :* bluish green to violet, deep bluish violet in holotype specimen. T3 on entire dorsum and medially on ventro-lateral surfaces with a covering of white pollinosity, very conspicuous in posterior view ; T4 without pollinosity ; T5 with a pair of very large and very conspicuous white pollinose spots which extend from extreme ventral margins of the tergite round to the latero-dorsal surfaces, the spots easily seen from above. T1+2 with a pair of strong median marginal setae ; T3 with a single lateral marginal seta on each side ; T3 with a pair of median discal setae, usually strong but one sometimes shorter and weaker than the other. Hair of dorsum of T3 erect and rather long spiniform on median third, semi-recumbent and finer laterally ; hair of T4 semi-erect on most of the dorsum, sometimes very slightly spiniform near the middle of the tergite but usually shorter and finer than that on T3 ; hair of T5 very fine and erect. ♂ hypopygium very similar to that of *S. albonotata* (Text-fig. 32). *Measurements :* body length 13·1 mm. (range 11·6–15·5 mm.) wing length 12·2 mm. (range 11·3–14·2 mm.) [5 specimens] : maximum measurements given are those of holotype.

♀. Almost identical with ♂ except for very slightly broader parafacials and genae and vertex almost equal in breadth to one eye when measured from above. *Measurements :* body length 14.4 mm. (range 12·2–15·8 mm.), wing length 12·6 mm. (range 10·0–14·2 mm.) [4 specimens].

Material examined. Holotype ♂, Philippine Islands : Luzon, Mt. Makiling (*Baker*). In British Museum (Natural History), London. Paratypes : Philippine Islands : 2 ♂♂, 1 ♀, Luzon, Mt. Makiling (*Baker*) (U.S. Nat. Mus.) ; 1 ♀ Luzon, Mt. Makiling (*Baker*) (B. M. Nat. Hist.) ; 1 ♂, Baguio, Benguet [? Luzon or Mindanao] (*Baker*) (U.S. Nat. Mus.) ; 1 ♀ Mindanao, Surigao (*Baker*) (U.S.

Nat. Mus.) ; 1 ♀, Mindanao, Kolambugan (*Baker*) (U.S. Nat. Mus.) ; 1 ♂, Mindoro, Baco River District, 1–23.i.1910 (*J. J. Mounsey*) (B. M. Nat. Hist.).

Distribution : The very limited amount of material available of this species is from Luzon, Mindoro and Mindanao islands, but *S. philippinensis* probably occurs in other islands of the Philippine group. The material seen is rather varied in size and colour, but is too limited to determine whether significant differences exist between forms from different islands ; the specimen from Mindoro however differs noticeably from the other specimens in having a dark narrow somewhat metallic violaceous gena and a shorter facial carina and shorter antennae than usual.

Affinities. The dark metallic non-pollinose upper parafrontals, the partly or completely dark face and antennae, and the black-haired genae of *S. philippinensis* sp. n. undoubtedly indicate affinity with *S. albonotata* (Bigot), the only other species of *Silbomyia* possessing these characters ; it is easily distinguished from *S. albonotata* by the much narrower interfrontal area, the much shorter antennae and facial carina and by other characters given in the key to the species.

Silbomyia fulgida (Bigot, 1859)

Spinthemyia fulgida Bigot, 1859, *Rev. Mag. Zool.* Ser. 2, **II** : 310. Holotype ♂, CELEBES. In the British Museum (Natural History), London.

Diagnosis. T1+2 with median marginal setae ; genal hair yellow ; wings uniformly brown ; dorsum of thorax brilliant metallic coppery green to reddish cupreous without trace of pollinosity.

♂. *Head :* Interfrontal area deep golden with a characteristic satiny sheen ; area of ocelli, vertex and upper halves of parafrontals semi-translucent yellowish, non-pollinose and rather shining ; lower parts of parafrontals, parafacials and genae with entirely yellow ground colour and dense creamy yellowish or pale yellow pollinosity ; facial carina, antennal foveae and epistome yellow with yellowish white pollinosity ; postorbits densely silvery white pollinose except on uppermost parts near the vertex which are bare shining metallic greenish or purplish black, shining white lower parts of postorbits strongly contrasting with yellow genae. Hair of parafrontals entirely black, hair of genae long and very pale yellow to golden orange. Upper occiput slightly metallic greenish especially near upper metallic ends of postorbits, elsewhere ground colour somewhat obscured by thin whitish pollinosity ; cerebrale semi-translucent yellowish like the vertex. Eye-vertex-eye ratio about 5 : 6 : 5. Interfrontal area 3·6–4·0 times as wide as a parafrontal. Facial carina long and laterally compressed, somewhat fusiform, nearly 1·3 times as long as distance from lunula to anterior ocellus and 4·0–4·4 times as long as epistome. Gena about one-fifth (0·19–0·22) of eye-height. Parafacial twice as broad as third antennal segment ; facial ridges very slightly concave in profile, with very fine hairs above vibrissae extending half or two-thirds of the way up each ridge. Postocellar setae very weak and hair-like, inconspicuous. Antennae bright orange, third segment 6·0–6·3 times as long as second segment ; bristle on second segment rather fine and much shorter than arista, latter very nearly equal in length to third antennal segment. Palpi yellow. *Thorax :* entire dorsum brilliantly metallic without pollinosity, usually coppery green but occasionally reddish copper or emerald-green with slight bluish reflections ; mesopleura and sternopleura green, each with a very large area of dense white pollinosity most conspicuous from above, areas under the pollinosity usually appearing blue-violet in certain lights ; pteropleura and hypopleura reddish or reddish brown, sometimes with a violaceous tinge. *Wings :* almost uniformly brown, at most becoming only a little paler posteriorly. Distance between bend of vein *M* and wing margin 1·9–2·2 times as great as that between *m–cu* and bend ; on vein *M* distance from *r–m* to *m–cu* 3·2–4·0 times as great as that between *m–cu* and the bend ; R_{4+5} and R_{2+3} not bowed

forwards. Costal spine very small and inconspicuous. Margin of lower calypter brown, calyptrae otherwise white. *Legs* : black, femora with the usual violet or dark greenish reflections. *Abdomen* : dorsum mostly brilliant metallic emerald or coppery green, becoming blue-violet apically and on extreme sides ; venter violet. T5 ventro-laterally with a median band of white pollinosity which extends on to the sides of the tergite but not on to the dorsum, the pollinosity only conspicuous from certain points of view ; T3 showing almost no trace of pollinosity dorsally, but with very thin traces of pollinosity ventrally visible in some lights. T1+2 with a pair of rather widely spaced median marginal setae, each seta sometimes duplicated on one or both sides ; median marginal setae of T3 sometimes duplicated on one or both sides so that there may be two, three or four median marginal setae on this tergite (three in holotype) ; always one lateral marginal seta on T3 ; T3 and T4 without median discal setae. Hair of T3 and T4 largely erect or semi-erect, especially in median area of each tergite where it is very slightly spiniform ; hair of T5 erect and finer than that of preceding tergites. ♂ hypopygium similar to that of *S. albonotata*. *Measurements* : body length 14·6 mm. (range 13·5–15·9 mm.), wing length 11·0 mm. (range 10·0–12·1 mm.), wings relatively short. [5 specimens].

♀. Some small specimens seen which lack definite median marginal setae on T1+2 and in which general colouring of the dorsum is metallic coppery crimson, but otherwise very much like ♂. Differs from ♀ in proportions of the head structures as follows : facial carina less definitely spindle-shaped, more ridge-like, shorter and usually about 3·2 times as long as epistome ; third antennal segment shorter, 4·4–4·7 times as long as second segment ; parafacials broader, about four times as wide as third antennal segment ; gena broader, a little over a quarter (0·26–0·27) of eye-height. Size very variable in material seen, measurements : body length 13·6 mm. (range 9·9–16·8 mm.), wing length 10·9 mm. (range 7·6–14·2 mm.) [11 specimens].

MATERIAL EXAMINED. Holotype ♂, CELEBES (no other data).

INDONESIA. CELEBES : 1 ♀, Macassar, 1857–58 (*A. R. Wallace*) (B. M. Nat. Hist., a paralectotype from mixed type-series of *Musca prospera* Walker) ; 2 ♂♂, 1 ♀, S. Celebes, Lompa-Battau, 3,000 ft., iii.1896 (*H. Fruhstorfer*) (B. M. Nat. Hist. and Div. Ent. Mus. Canberra) ; 1 ♂, 2 ♀♀, S. Celebes, Bua-Kraeng, 5,000 ft., ii.1896 (*H. Fruhstorfer*) (B. M. Nat. Hist.) ; 1 ♂, Nord-Celebes, Toli-Toli, xi–xii.1895 (*H. Fruhstorfer*) (Zool. Mus. Humb. Univ.) ; 4 ♀♀, Ile-Ile, 500–800 m., xii.1930 (*G. Heinrich*) (Zool. Mus. Humb. Univ.) ; 3 ♀♀, Latimodjonggeb. (=Latimodjon Gebirge), Uru, 800 m., viii–ix.1930 (*G. Heinrich*) (Zool. Mus. Humb. Univ.) ; 1 ♀, Bantimoeroeng, viii.1931 (*G. Heinrich*) (Zool. Mus. Humb. Univ.).

In addition to the foregoing material I have seen one ♂ of this species (in Staatl. Mus. Stuttgart) bearing a single label reading ' Roon ' ; this locality lies in Geelvink Bay, New Guinea, an area much further east than the known distribution limits of *Silbomyia* and no other material of *S. fulgida* has been seen from outside Celebes ; the label ' Roon ' is almost certainly erroneous, and the specimen is presumed to be from Celebes. The material collected by G. Heinrich listed above is that already recorded in the literature by Enderlein (1936, p. 440).

Distribution : Probably confined to Celebes, where it occurs together with *S. albonotata* (Bigot).

AFFINITIES. *S. fulgida* appears to be most closely related to *S. albonotata* (for differences see under this species) and allied to a lesser extent to *S. sumba* sp. n. From the latter species it is distinguished most easily by the bare shining metallic upper ends of the postorbits, by the non-pollinose mesonotum and uniformly brown wings ; the shape of the head structures is also quite different.

Silbomyia sumba sp. n.

DIAGNOSIS. T1 +2 with median marginal setae; genal hair yellow ; hair of lower parafrontals pale yellow ; upper occiput and uppermost parts of postorbits not at all metallic, thickly pale yellow pollinose.

♀. *Head* : Interfrontal area orange-yellow ; vertex, parafrontals, parafacials, genae, facial carina, antennal foveae and epistome all orange-yellow in ground colour and densely golden yellow pollinose ; postorbits entirely pale yellow pollinose, upper ends not at all bare or metallic. Parafrontals with a few fine black hairs on upper parts, but lower halves of parafrontals with pale yellow hair which is difficult to see against the yellow pollinose background ; hair of genae long and golden yellow. Upper occiput with unusually thick pale yellow pollinosity covering all the dark ground colour, occiput therefore not at all metallic and unicolorous with postorbits ; cerebrale orange-yellow. Vertex narrower than one eye viewed from above, eye-vertex-eye ratio 5 : 4 : 5. Interfrontal area 3·2 times as wide as a parafrontal at level of lower proclinate orbital seta. Facial carina rather short and broad, especially ventrally, not at all fusiform and not laterally compressed, only slightly longer than distance from lunula to anterior ocellus and 3·0 times as long as epistome. Gena slightly more (0·27) than a quarter of eye-height. Parafacial 2·5 times as wide as third antennal segment. Facial ridges with a few very fine small hairs only on lower quarter, some of the hairs pale. Postocellar setae fine and hair-like. Antennae orange, third segment 4·1 times as long as second segment ; seta on second segment weak, much shorter than arista, the latter about equal in length to third antennal segment. Palpi yellow. *Thorax* : emerald or coppery green, slightly violaceous on parts of pteropleura and hypopleura ; dorsum only partly metallic, when viewed from behind showing a thin covering of white pollinosity on most of prescutum and dense white pollinosity on notopleura, areas of supra-alar setae and on postalar calli ; mesopleura and sternopleura with large densely white pollinose spots. *Wings* : dark brown antero-basally with the infuscation rapidly fading to almost clear hyaline apically and posteriorly except for slight trace of brownish infuscation along veins *M* and Cu_1. Distance between bend of *M* and wing margin about 1·1–1·4 times as great as that between bend and *m–cu* ; on vein *M* distance between *r–m* and *m–cu* 2·5–2·9 times as great as that between *m–cu* and bend ; veins R_{2+3} and R_{4+5} not conspicuously bowed forwards. Costal spine a little shorter than *r–m*. Margin of lower calypter brown, calyptrae otherwise white. *Legs* : black, very slightly coppery greenish metallic on the femora. *Abdomen* : entirely bright green with a slight coppery tinge. T5 with a pair of exceptionally small spots of white pollinosity situated just ventrad to the lateral margins, the spots not reaching on to the dorsum ; T3 with only a very slight trace of whitish pollinosity ventro-laterally. T1+2 with a pair of strong median marginal setae ; T3 with one lateral marginal seta on each side and with the pair of median marginal setae very long and erect ; T3 and T4 without median discal setae. Hair of dorsum short and rather fine, especially on T5, erect on median parts of T3 and T4 but only semi-erect laterally. *Measurements* : body length 12·4, 12·8 mm., wing length 10·0, 10·5 mm. [2 specimens].

♂. Unknown. Probably much like ♀ but with longer facial carina and possibly more elongate antennae.

MATERIAL EXAMINED. Holotype ♀, INDONESIA : N. W. Soemba (= Sumba Island), Laora, 100 m., iv.1925 (*Dammerman*). In United States National Museum, Washington. Paratype : 1 ♀, INDONESIA : Sumba (no other data) (D. Ent. Inst.).

Distribution : Known only from the type material listed above from Sumba Island, Indonesia, and probably confined to this island.

AFFINITIES. *S. sumba* sp. n. is a distinctive species but shows some probable affinity with *S. fulgida* (Bigot) ; it is most easily distinguished from *fulgida* by the entirely pollinose postorbits and upper occiput, the white pollinosity on the mesonotum, the pale yellow lower parafrontal hair, and unevenly darkened wings.

Silbomyia palawana sp. n.

DIAGNOSIS. T1+2 with median marginal setae; face and genal hair yellow; facial carina very short and ridge-like, antennae correspondingly short, in both sexes; much of mesonotum and abdominal T3 with conspicuous white pollinosity, especially seen from behind.

♀. *Head* : Interfrontal area bright orange ; small ocellar spot slightly metallic blue-green ; vertex and upper parts of parafrontals semi-translucent yellowish and hardly at all pollinose, slightly shining ; lower parts of parafrontals, parafacials, genae, facial carina, antennal foveae and epistome with all yellow ground colour, pollinosity creamy white against eye-margin but darkening on parafacials anteriorly to yellow-orange against facial ridges (when viewed from above all of parafacials appearing shining creamy white), genae densely golden orange pollinose ; postorbits entirely white pollinose, contrasting with yellow genae, uppermost extremities not at all metallic. Parafrontal hair all black, genal hair short and golden yellow. Upper occiput semi-metallic blue greenish in some lights, but thinly covered with whitish pollinosity ; cerebrale orange. Eye-vertex-eye ratio almost exactly 1 : 1 : 1. Interfrontal area 2·3 times as wide as a parafrontal. Facial carina short and broad, ridge-like, shorter than distance from lunula to anterior ocellus and 2·8 times as long as epistome. Gena about one-fifth (0·22) of eye-height. Parafacial three times as wide as third antennal segment. Facial ridges with a few hairs above vibrissae only on lower quarter. Postocellar setae weak. Antennae orange, third segment 3·5 times as long as second segment ; seta on second segment about equal in length to arista, latter conspicuously longer than third antennal segment. Palpi yellow. *Thorax* : bluish green in the single specimen seen, probably varying from green to blue-violet ; hypopleura and pteropleura reddish brown with violaceous reflections ; most of mesonotum but especially prescutum, notopleura, areas of supra-alar setae and postalar calli white pollinose, pollinosity most obvious from behind ; mesopleura and sternopleura each with a large area of dense white pollinosity. *Wings* : very dark brown, almost blackish brown, on most of surface but distinctly paler in cells and marginally. Distance between bend of vein *M* and wing margin 1·9 times as great as that between *m–cu* and bend ; on vein *M* distance from *r–m* to *m–cu* 2·8 times that between *m–cu* and the bend. Costal spine shorter than *r–m*. Margin of lower calypter dark brown, calyptrae otherwise white. *Legs* : black, femora largely dark greenish metallic. *Abdomen* : in single specimen seen mainly bluish green but violaceous on all of T1+2 and on fore and hind margins of other tergites, the violet margins broadest ventrally ; colour probably varies from green to bluish violet. T3 on all dorsal surface and medially on the sides with an even covering of white pollinosity, visible to naked eye when viewed from behind ; T4 with very thin traces of a whitish pollinose covering when seen by microscopic examination from behind, not readily visible to naked eye ; T5 with a pair of large densely pollinose white spots ventro-laterally which extend round the sides of the tergite just on to the latero-dorsal surfaces. T1+2 with a pair of strong median marginal setae ; T3 with a single lateral marginal seta on each side ; T3 and T4 without median discal setae. Hair of T3 and T4 uniform, not evidently spiniform, recumbent ; hair of T5 short, sparse and erect, much finer than that on preceding tergites. *Measurements* : body length 14·9 mm.. wing length 13·7 mm. [1 specimen].

♂. Extremely like ♀, obviously differing only in the narrower gena. Facial carina and antennae not sexually dimorphic. ♂ hypopygium as in *S. sauteri*. In the one ♂ seen the thorax is dark blue and the abdomen violaceous blue, but the general body colour almost certainly varies in this species from green or bluish green to blue-violet or violet. Abdominal hair more erect in ♂ than ♀, judging from only a single specimen of each. *Measurements* : body length 14·1 mm., wing length 12·8 mm. [1 specimen].

MATERIAL EXAMINED. Holotype ♀, PALAWAN ISLAND (Philippines) : N. Palawan Binaluan, xi–xii.1913 (*G. Boettcher*). In British Museum (Natural History), London.

Paratype : 1 ♂, PALAWAN ISLAND : Puerto Princesa (*R. C. McGregor*) (U.S. Nat. Mus.).

Distribution : Occurring only on Palawan, Philippine Islands, between Borneo and the Philippines proper and known to me only from the type-material listed above.

AFFINITIES. Undoubtedly closely related to *S. sauteri* Enderlein and *S. hoeneana* Enderlein, resembling both very closely but almost certainly specifically distinct ; *S. palawana* sp. n. is distinguished from both these species by the possession of a pair of strong median marginal setae on T1+2, by the much narrower vertex and interfrontal area, by the narrow gena, and by the much finer less obviously spiniform hair of the abdominal tergites. From *S. sauteri* it differs also by lacking median discal setae on T3 and T4.

Silbomyia parvula Baranov, 1938

Stilbomyia parvula Baranov, 1938, *Bull. ent. Res.* **29** : 414. Lectotype ♂, INDIA. In the British Museum (Natural History), London.

LECTOTYPE DESIGNATION : Baranov did not designate a single type-specimen and the original description is based on two syntypes (in B.M. Nat. Hist.), a ♂ and a ♀ each labelled in Baranov's handwriting " Stilbomyia parvula sp. n. N. Baranov ". The ♂ syntype has been labelled and is here designated as lectotype.

DIAGNOSIS. Very small species with almost clear hyaline wings ; T1+2 without median marginal setae ; ♂ antennae inserted far above level of eye middle, antennae and facial carina exceptionally elongate ; vertex very conspicuously broader than one eye viewed from above.

♂. *Head* : Interfrontal area bright orange-yellow ; uppermost third of parafrontals from *upper* proclinate orbital setae to vertical setae yellow and semi-shining, non-pollinose ; middle part of parafrontal between upper and lower proclinate orbital setae yellow with pale yellow pollinosity ; parafrontals ventrad of lower proclinate orbital setae and all of parafacials yellowish white in ground colour with dense creamy white pollinosity, the pollinosity appearing rather shining white from above ; genae yellow with dense golden yellow pollinosity ; facial carina, antennal foveae, and epistome yellow with thin pale yellow pollinosity ; postorbits all silvery white pollinose. Parafrontals with short fine and sparse hair, all black ; hair of genae bright yellow. Upper occiput unusually thickly covered with white pollinosity, not at all metallic in any light ; cerebrale orange-yellow. Vertex from above very noticeably broader than one eye, eye-vertex-eye ratio 5 : 7 : 5. Interfrontal area 3·5 times as wide as a parafrontal. Frons prominent and less steeply sloping than usual, antennae inserted far above level of eye middle, facial profile much longer than frontal profile and facial carina, antennal foveae and facial ridges therefore all longer than usual. Facial carina long and subfusiform, less strongly tapering ventrally than dorsally, outer surface somewhat flattened and sides pinched in towards one another so that antennal foveae are very deeply formed, the carina 1·6–1·7 times as long as distance from lunula to anterior ocellus and 4·5 times as long as epistome. Gena very broad, about three-sevenths (0·43–0·44) of eye-height. Parafacial 1·5 times as wide as third antennal segment. Facial ridges straight in profile, fine hairs above vibrissae reaching about two-fifths of the way up each facial ridge. Postocellar setae small. Antennae bright orange, exceptionally long, third segment about 7·5 times as long as second segment ; seta on second segment short

and strong, little more than half as long as arista ; the arista short and unusually strongly thickened nearly to the end, slightly over half as long as third antennal segment and plumose hairs short and rather dense. Palpi yellow. *Thorax* : mesonotum bluish green, scutellum darker greenish blue to violaceous blue ; sides of thorax greenish blue to deep violet-blue, except for hypopleura and pteropleura which are more reddish violaceous. Whole of humeral calli, all of prescutum, posterior and lateral margins of scutum unusually thickly white pollinose, when seen from behind therefore only the centre of the scutum metallic ; mesopleura and sternopleura with large spots of dense white pollinosity. A few of the hairs of the propleura pale yellow. *Wings* : almost entirely clear hyaline, only a little brownish infuscation of the membrane between the costa and R_{2+3} ; alula largely opaque white ; veins around basal cells yellow, giving the wing-base a yellowish appearance to naked eye. Distance from bend of vein *M* to wing margin 2·5 times as great as that between *m–cu* and the bend ; on vein *M* distance from *r–m* to *m–cu* 3·1 times as great as that between *m–cu* and bend. Costal spine long, about equal in length to *r–m*. Calyptrae white, including entire posterior and outer margins of lower calypter. *Legs* : black, femora with bluish green to violaceous metallic reflections. *Abdomen* : violaceous blue on T1 + 2 and T3, blue-green on T4, and T5, traces of violaceous colour anteriorly on dorsum of T4 and narrow fore and hind margins ventrally of T4 also violet. T3 dorsally rather thickly white pollinose, latero-ventrally with broad conspicuous white pollinose bands, appearance of the latero-ventral pollinosity shifting with the light ; T5 with the usual pair of densely pollinose silvery white spots, but these spots much larger and more conspicuous than in other species, well formed on dorsum of T5 and extending towards midline so that only median third of dorsum is non-pollinose, appearance of the spots changing very much with the direction of the light. T1 + 2 without median marginal setae ; the lateral marginal setae of T3 single on each side ; T3 and T4 without median discal setae. Hair of dorsum all recumbent, finest on T5 and slightly thickened medially on T3. ♂ hypopygium much as in *fuscipennis*. *Measurements* : body length 9·4, 9·9 mm., wing length 7·6, 7·8 mm. [2 specimens].

♀. Mostly like ♂, but head in the sexes strikingly sexually dimorphic, face and antennae not greatly elongated as in ♂ ; facial carina only 3·1 times as long as epistome and very little longer than distance from lunula to anterior ocellus, third antennal segment only 3·5 times as long as second segment, parafacial nearly two and a half times as wide as third antennal segment. Facial carina less compressed laterally than in ♂, and arista less noticeably thickened with sparser longer plumosity ; since third antennal segment is short the arista is nearly equal in length to third antennal segment. *Measurements* : body length 8·9 mm., wing length 7·7 mm. [1 specimen].

MATERIAL EXAMINED. Lectotype ♂, INDIA : Coimbatore, 10.xii.1920 (*A. A. Coll*). Paralectotype : ♀, INDIA : Coimbatore, 7.xii.1920 (*A. A. Coll.*) (B.M. Nat. Hist.). Both lectotype and paralectotype labelled ' from night soil '.

INDIA : 1 ♂, Coimbatore, 18.ix.1935 (*S. R. Coll*) (B.M. Nat. Hist.) ; this specimen also labelled ' on Acacia leucophloea '.

In addition to the foregoing material the B.M. Nat. Hist. collection contains five female specimens each labelled ' India ex coll. Bombay Nat. Hist. Socy. ' which agree closely with the type-material but differ in having the wings conspicuously dark brown infuscate antero-basally and the margin of the lower calypter brown : there is no male with these specimens and I therefore only refer them tentatively to *S. parvula*.

Distribution : Southern India.

AFFINITIES. *S. parvula* Baranov is an unusually small distinctive species showing evident affinity with *S. minor* Malloch from Queensland ; it is easily recognised by the structure of the head, particularly in the ♂ and by the very characteristic thick covering of white pollinosity on most of the mesonotum.

Silbomyia minor Malloch, 1930

Stilbomyia minor Malloch, 1930, *Proc. Linn. Soc. N.S.W.* **55** : 102. Holotype ♀, QUEENSLAND. In the Division of Entomology Museum, C.S.I.R.O., Canberra.

DIAGNOSIS. Exceptionally small Australian species, length 6·6 mm. ; T1+2 without median marginal setae ; wing dark brown infuscate only antero-basally ; gena half eye-height ; occiput semi-metallic greenish.

♀. *Head* : Interfrontal area bright deep yellow ; parafrontals between upper proclinate orbital setae and vertical setae yellow and semi-shining, non-pollinose ; remainder of parafrontals, parafacials, genae, facial carina, antennal foveae and epistome all with yellow ground colour and yellow pollinosity ; postorbits with blackish ground colour and dense silvery white pollinosity, in some lights very slightly metallic near outer vertical setae. Hair of parafrontals black ; hair of genae and postbuccae yellow. Upper occiput dark greenish metallic in most lights, very thinly whitish pollinose ; cerebrale orange-yellow. Vertex distinctly broader than one eye, eye-vertex-eye ratio 16 : 21 : 16. Interfrontal area 3·0 times as wide as a parafrontal. Facial carina long and widening below, outer surface rather rounded, 1·4 times as long as distance from lunula to anterior ocellus and 4·0 times as long as epistome ; carina rather indistinctly defined from the epistome. Gena exceptionally broad, almost exactly half eye-height. Parafacial about 2·5 times as wide as third antennal segment. Fine hairs above vibrissae extending about one-third of way up each facial ridge. Postocellar setae small, ocellar setae very strong.

Antennae yellowish orange, elongate, third segment 4·7 times as long as second segment ; seta on second segment very strong but much shorter than arista, latter equal in length to third antennal segment. Palpi yellow. *Thorax* : mesonotum and scutellum bright green, prescutum anteriorly with a pair of fine coppery lines visible in some lights ; mesopleura and most of sternopleura bright green, pteropleura, hypopleura and lower parts of sternopleura largely violaceous. Notopleura with conspicuous white pollinosity, prescutum and sides of scutum with only very thin inconspicuous whitish pollinosity visible in some lights ; pollinosity on prescutum not obviously reaching transverse suture (as it does in *parvula*) ; mesopleura and sternopleura each with a large white pollinose spot whose appearance shifts with the light. *Wings* : largely clear hyaline, dark brown infuscation confined to antero-basal area and not extending posteriorly beyond vein *M*. Distance from bend of vein *M* to wing margin 1·9 times as great as that between *m-cu* and bend ; on vein *M* distance from *r-m* to *m-cu* 2·9 times that between *m-cu* and bend. Costal spine nearly as long as *r-m*. Calyptrae white except for brown margin of lower calypter. *Legs* : black, femora partly metallic greenish. *Abdomen* : mainly brilliant green, dorsal excavation of T1+2 and all sternites more violaceous ; T5 with a slight coppery tinge. T3 almost completely devoid of white pollinosity, only thinnest traces visible in certain lights even on latero-ventral surfaces ; T4 non-pollinose ; T5 with a pair of small lateral white pollinose spots which dorsally extend on to extreme sides of the tergite, appearance of the spots strongly shifting with the light. T1+2 without median marginal setae ; T3 with one lateral marginal seta on each side ; T3 and T4 without median discal setae. Hair of dorsum, including that on T5, recumbent. *Measurements* : body length 6·6 mm., wing length 5·8 mm. [1 specimen].

♂. Unknown, but almost certainly with the facial carina and antennae very elongate and much longer than in ♀, probably with antennae in profile inserted above level of eye middle.

MATERIAL EXAMINED. Holotype ♂, AUSTRALIA : Queensland, Eidsvold, 1923 (*Bancroft*).

No other material is known.

Distribution : Known only from the holotype from Eidsvold in southern Queensland.

AFFINITIES. Although only known from the female the affinities appear to lie most closely with *S. parvula* ; the shape of the head and facial carina, the unusually broad gena, and the darkening of the wings being confined to the antero-basal region are all characters closely similar in the two species (together with the small size to which both specific names refer).

Silbomyia timorensis sp. n.

DIAGNOSIS. Fore tibia with only one submedian *pv* seta ; wings only dark brown infuscate antero-basally, elsewhere almost clear.

♀. *Head* : Interfrontal area deep yellow or orange-yellow ; parafrontals yellow, upper parts rather shining, lower parts pale yellow pollinose, sometimes a little white pollinose against eyes ; parafacials yellow with golden or yellow pollinosity near facial ridges and brilliant white pollinosity against eyes, contrast between yellow and white pollinose areas more conspicuous in some lights than others, to naked eye parafacials appearing generally pale yellowish ; genae yellow with dense golden yellow pollinosity ; facial carina, antennal foveae and epistome yellow with very thin pale yellowish pollinosity ; postorbits densely silvery white pollinose, colour contrasting with yellow genae ; postbuccae yellow with very thin yellowish white pollinosity. Parafrontal hair black ; hair of genae and postbuccae pale yellow to golden, sometimes one or two blackish hairs among pale genal hair. Upper occiput very thinly and evenly whitish pollinose over blackish ground colour, not appearing at all metallic ; cerebrale orange. Vertex a little broader than one eye viewed from above, eye-vertex-eye ratio about 5 : 6 : 5 or 9 : 11 : 9. Interfrontal area almost exactly three times as wide as parafrontal at level of lower proclinate orbital seta. Facial carina slightly elongate, rather rounded on outer surface and not formed into definite median ridge (much as in ♀ *latigena*), slightly longer than distance from lunula to anterior ocellus, 2·75–3·0 times as long as epistome. Gena 0·31–0·33 of eye-height. Parafacial about three times as wide as third antennal segment. Fine hairs above vibrissae confined to lower third of each facial ridge. Postocellar setae weak. Antennae pale orange, third segment 3·7–3·9 times as long as second segment ; seta on second segment weak, much shorter than third segment ; arista slightly longer than third antennal segment. Palpi yellow. *Thorax* : varying from coppery green through greenish blue to dark blue with violet tinge ; hypopleura and pteropleura dark reddish brown with violaceous or greenish reflections. Each mesopleuron and sternopleuron with large bold white pollinose area. From behind mesonotum showing conspicuous white pollinosity on notopleura and marginally on scutum in supra-alar and post-alar regions, prescutum with covering of white pollinosity which fades out towards transverse suture. *Wings* : mainly almost clear, only dark brown infuscate antero-basally with hardly any trace of brownish colouring along other veins. Distance from bend of vein *M* to wing margin 2·0 times as great as that between *m-cu* and bend ; on vein *M* distance from *r-m* to *m-cu* 3·4–3·5 times as great as that between *m-cu* and bend. Calyptrae white except for dark brown margin to lower calypter. *Legs* : black except for violet or greenish blue tinge to femora. Fore tibia with only one *pv* seta. *Abdomen* : dark green to violaceous blue, hind margins of tergites appearing narrowly blackish to naked eye. T3 dorsally with a covering of thin white pollinosity which extends on to extreme sides of tergite, pollen invisible in some lights and most conspicuous

from behind ; T4 non-pollinose ; T5 with usual broad lateral bands of white pollinosity extending on to dorsum, appearance much shifting with direction of light but paired white areas easily visible to naked eye. T1+2 without median marginal setae ; T3 with one lateral marginal seta on each side ; T3 and T4 without median discal setae ; Hair of dorsum of tergites all recumbent. *Measurements* : body length 11·9 mm. (range 11·7–12·3 mm.), wing length 9·6 mm. (range 9·2–9·8 mm.) [5 specimens].

♂. Unknown. Probably generally like ♀ but with longer and more fusiform facial carina and possibly longer antennae.

Material examined. Holotype ♀, Indonesia : Timor, Koepang (= Kupang), 6–21.vi.1929 (*I. M. Mackerras*). In Division of Entomology Museum, C.S.I.R.O., Canberra. Paratypes : Indonesia : 1 ♀, data as for holotype (Div. Ent. Mus. Canberra) ; 1 ♀, Timor, Soe, 2,000 ft., 21.vi.1929 (*I. M. Mackerras*) (B.M. Nat. Hist.) ; 2 ♀♀, Timor, Lelogama, v.1911 (*Haniel*) (Zool. Sammlung. Munich and B.M. Nat. Hist.) ; 1 ♀, Timor, Niki-Niki, vi.1911 (*Haniel*) (Zool. Sammlung. Munich).

The three paratypes from Lelogama and Niki-Niki each bear a label reading 'Stilbomyia fuscipennis det. Engel' and are the specimens from Timor mentioned by Engel (1925, p. 350) under *S. fuscipennis* as ' mit hellen Zellkernen der Flügel '.

Distribution : As yet known only from the above-listed localities in western (Indonesian) Timor, and almost certainly confined to the island of Timor.

Affinities. Distinguished from all other species by presence of only one instead of the usual two *pv* setae on fore tibia, but the form of the facial carina (slightly elongate and not produced to a definite median ridge) suggests affinity with *S. latigena*. The shining white pollinosity externally on the parafacials resembles that of *S. asiatica* sp. n., but *S. timorensis* sp. n. is easily distinguished from this species and from *latigena* by the largely hyaline wings (darkened only antero-basally) as well as by the presence of the single fore tibial *pv* seta.

Silbomyia fuscipennis (Fabricius, 1805)

Musca fuscipennis Fabricius, 1805, *Systema Antl.* : 291. Holotype ♀, SUMATRA. In the Universitetets Zoologiske Museum, Copenhagen.

Diagnosis. In both sexes bend of vein *M* unusually remote from wing margin, distance between bend and wing margin about 3·5 times that between bend and cross-vein *m-cu* ; vein R_{2+3} strongly bowed forward so that cell R_1 is strongly narrowed and tapering ; costal thorn longer than cross-vein *r-m*.

♂. *Head* : Interfrontal area orange or reddish orange ; parafrontals, parafacials, facial ridges, antennal foveae, facial carina, epistome and genae orange-yellow with golden yellow pollinosity ; postorbits pale yellow or silvery yellow pollinose ; postbuccae with pale yellow ground colour and yellowish white hair ; genal hair golden yellow. Upper occiput greenish or violet-black, slightly metallic, with thin greyish pollinosity, cerebrale orange. Eye-vertex-eye ratio : 33 : 31 : 33. Interfrontal area very broad, about 3·7 times as wide as a parafrontal. Facial carina very long and narrow, slightly fusiform and laterally compressed, a little longer than distance from lunula to anterior ocellus and about 6·2–6·6 times as long as epistome ;

epistome therefore relatively short. Gena slightly more than one-sixth (0·18–0·19) of eye-height. Parafacials narrow, only slightly wider than third antennal segment ; facial ridges nearly straight in profile, with fine setulae for about one-third of their length above the vibrissae. Postocellar setae fine and weak. Antennae inserted well above level of eye-middle in profile. Antennae orange, third segment very long and about 6·2 times as long as second segment ; seta on second segment short and rather weak, only about half as long as arista ; arista longer than third antennal segment. Palpi yellow. *Thorax* : varying from bluish green (as in holotype) to violet, but usually dark blue or violet-blue, slightly metallic. Mesonotum without obvious pollinosity to naked eye, but when viewed from behind thin white pollinosity visible on all the prescutum, humeral calli, notopleura and area of the supra-alar setae ; mesopleura and sternopleura with patches of conspicuous white pollen, those on sternopleura less obvious than those on mesopleura. *Wings* : uniformly and consistently dark brown, the colour even throughout the wing and not at all faint in the middle of the cells. Bend of vein *M* unusually remote from wing margin, distance from margin to bend 3·5–4·0 times that between the bend and cross-vein *m-cu* ; on vein *M* distance from *r-m* to *m-cu* about four and half times that between *m-cu* and the bend ; veins R_{2+3} and R_{4+5} strongly bowed forward, cell R_1 very narrow and very strongly tapering apically (Text-fig. 18). Costal spine long and conspicuous, longer than cross-vein *r-m*. Lower calypter white, the margin darkened brownish apically and becoming very dark brown on the scutellar margin. *Legs* : black, femora somewhat metallic violaceous. *Abdomen* : unicolorous with the thorax, varying from bluish green to violet but most frequently greenish blue or violet-blue, hind margins of intermediate segments appearing slightly black to naked eye. T3 with very thin whitish pollinosity, best seen when viewed from behind, T4 with thin white pollen laterally, the pollinosity inconspicuous but visible to naked eye on both intermediate segments ; T5 dorsally with a band of white pollen on each side which extends round laterally to lower surface, appearance of this pollinosity shifting with the light, but the pollen more conspicuous to naked eye than that on T3 and T4. The traces of whitish pollen and the darkened intersegmental appearance give the abdomen a slightly banded appearance to naked eye. T1+2 without median marginal setae ; T3 with two lateral marginal setae on each side ; T3 and T4 without median discal setae. Hair of tergites rather fine and recumbent. ♂ hypopygium as in figs. 31 and 34. *Measurements* : body length 13·6 mm. (range 11·0–15·8 mm.), wing length 12·2 mm. (range 9·9–13·7 mm.) [20 specimens].

♀. Closely similar to ♂ except in details of the facial carina and antennae. Facial carina broader than in ♂, ridge-like and not at all fusiform, only about 4·5 times as long as epistome and equal in length to distance between lunula and anterior ocellus ; third antennal segment not conspicuously elongate, about 4·5 times as long as second segment. Gena and parafacial broader than in ♂, gena about one-quarter of eye-height and parafacial over twice as wide as third antennal segment. In profile antennae inserted about on a level with eye-middle. Postorbits sometimes more conspicuously golden pollinose than in ♂. *Measurements* : body length 13·8 mm. (11·5–15·4 mm.), wing length 12·0 mm. (range 10·1–13·3) [20 specimens].

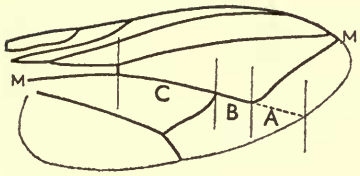
MATERIAL EXAMINED. Holotype ♀, SUMATRA : (*Daldorf*).

INDONESIA. SUMATRA : 3 ♂♂, N. O. Sumatra, Deli (*S. G. Martin*) (Zool. Mus. Humb. Univ.) ; 7 ♂♂, Deli (*G. Martin*) (Zool. Mus. Humb. Univ.) ; 2 ♂♂, Deli (*G. Martin*) (B.M. Nat. Hist.) ; 1 ♀ (*Westermann*) (Zool. Mus. Humb. Univ.) ; 2 ♀♀, Tandiong Merah, 18.xii.1918 (*J. B. Corporaal*) (Zool. Mus. Amsterdam) ; 1 ♀, Negri Baroe, 3.viii.1917 (*J. B. Corporaal*) (Zool. Mus. Amsterdam). JAVA : 1 ♀, Batoerradan, G. Siamat., 29.vii.1938 (*F. C. Drescher*) (Zool. Mus. Amsterdam) ; 1 ♂, G. Papandajan, Garoet, Preanger, 4–6,000 ft., i.1891 (*I. Z. Kannegieter*) (B.M. Nat. Hist.) ; 1 ♀, Pelaboean, Ratoe (B.M. Nat. Hist.) ; 2 ♂♂, 2 ♀♀, West Java, Djampang Mts., G. Malang, 4,000 ft., i.1938 (B.M. Nat. Hist.) ; 2 ♂♂, 2 ♀♀, West

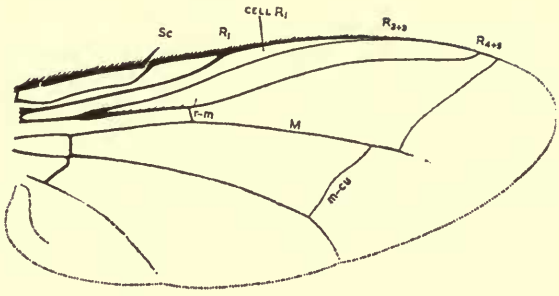
Java, Djampang Mts., Tjampana, viii.1937 (B.M. Nat. Hist.) ; 1 ♂, West Java, Djampang Mts., G. Mimerang, ix.1938 (B.M. Nat. Hist.); 1 ♂, West Java, Djampang Mts., Tjtalahab, ix.1937 (B.M. Nat. Hist.) ; 1 ♂, West Java, Djampang Mts., G. Besser, xi.1937 (B.M. Nat. Hist.) ; 1 ♂, 2 ♀♀, West Java, Djampang Mts., Bibidjilan, x.1937 (B.M. Nat. Hist.) ; 1 ♂, West Java, Djampang Mts., Tjiangsana, xi.1937 (B.M. Nat. Hist.) ; 2 ♂♂, West Java, Djampang Mts., Radjamandala, 1,200 ft., xi.1937 (B.M. Nat. Hist.) ; 1 ♀, Balokambong, Tjiletoch Bay, viii.1937 (B.M. Nat. Hist.) ; 8 ♂♂, 3 ♀♀, Soekaboemi, iii–vii.1926 (*E. le Moult*) (B.M. Nat. Hist.) ; 1 ♂, 3 ♀♀, Soekaboemi, vi.1925 (*E. le Moult*) (B.M. Nat. Hist.) ; 25 ♂♂, 14 ♀♀, Soekaboemi (*E. le Moult*) (B.M. Nat. Hist.) ; 11 ♂♂, 1 ♀ (*E. le Moult*) (B.M. Nat. Hist.) ; 5 ♂♂ (B.M. Nat. Hist.); 2 ♀♀, Java occ., Preanger, 1–2,000 m. (D. Ent. Inst.) ; 1 ♂, Westjava, Sisoeroele, 800 m., ii–iii (*Zobrys u. Wolter S. V.*) (Zool. Mus. Humb. Univ.) ; 1 ♂ (*Westermann*) (Zool. Mus. Humb. Univ.) ; 1 ♂ (*Fritz*) (Zool. Mus. Humb. Univ.) ; 2 ♀♀, Garoet (Rijksmus. Leiden) ; 1 ♀ (*Kuhl*) (Rijksmus. Leiden) ; 1 ♀ (*v. Hartlieb*) (Zool. Sammlung. Munich) ; 1 ♂, Java occ., Preanger, 1–2,000 m. (Zool. Sammlung. Munich) ; 1 ♂ (Zool. Sammlung. Munich) ; 1 ♂, Batavia (Staatl. Mus. Stuttgart) ; 1 ♀, Java (Oxford Mus.) ; 1 ♂, Depok, 13.ii.1921 (*Karny*) (U.S. Nat. Mus.) ; 1 ♂, Depok (U.S. Nat. Mus.). In addition 3 ♀♀ without data, presumed locality Java (Oxford Mus.).

Distribution : *S. fuscipennis* appears to be confined to the islands of Java and Sumatra, and no specimens of true *fuscipennis* have been seen from elsewhere ; the Rijksmuseum van Natuurlijke Historie collection in Leiden contains a female specimen labelled " Borneo ", but this is probably erroneous and there is no other evidence that *S. fuscipennis* occurs in Borneo. All published records of *S. fuscipennis* from anywhere other than Java or Sumatra are the result of misidentifications. Engel (1925, p. 350) recorded *fuscipennis* from Canton and Formosa, but examination of the material (in Zoologische Sammlung, Munich) on which these records are based has shown that the specimen from Canton belongs to *S. hoeneana* Enderlein and that the specimens from Formosa are a mixed series of *S. latigena* Enderlein and *S. sauteri* Enderlein ; the specimens from Timor recorded by Engel (*loc. cit.*) as *fuscipennis*, belong to the new species *S. timorensis* described on page 67.

Affinities. *S. fuscipennis* (Fabricius) is very closely allied to *S. latigena* Enderlein, the general facies and structure of the facial carina being very similar in the two species, but is easily distinguished by the wing venation (cf. Text-figs. 18 and 20) ; in *fuscipennis* the bend of *M* is much more remote from the wing margin, and the anteriormost veins strongly bowed forwards. The long costal spine also distinguishes *S. fuscipennis* from *S. latigena* ; the wing of *fuscipennis* resembles that of *S. mackerrasi* sp. n. but the two species are easily distinguished by the characters given in the key.



17



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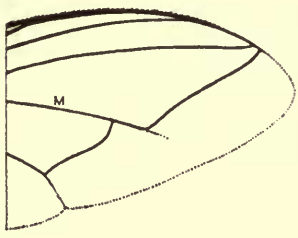

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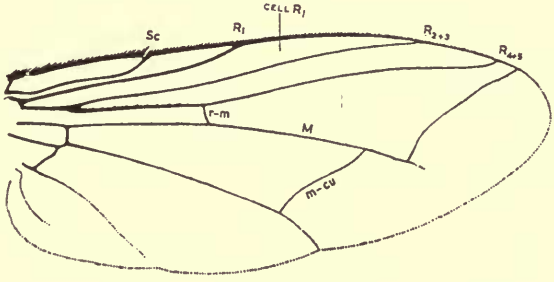

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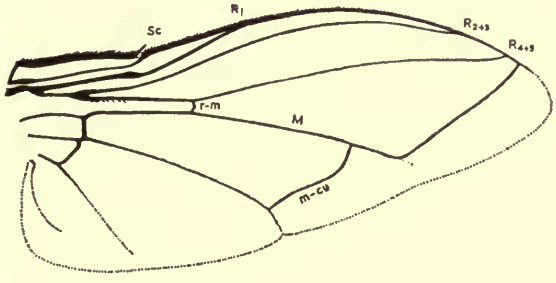
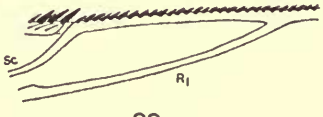
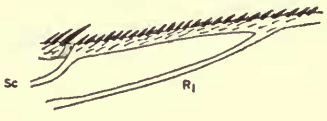


21



22



23

FIGS. 17–23. 17. Semi-diagrammatic representation of Ameniine wing showing measurements made : bend of vein *M* to wing margin (A), *m–cu* to bend of *M* (B), and cross-vein *r–m* to cross-vein *m–cu* (C). 18. Wing of *Silbomyia fuscipennis* (Fabricius) showing remoteness of bend of vein *M* from wing margin and strong forward bowing of vein R_{2+3}. 19. Apical half of wing of *Amenia longicornis* (Malloch). 20. Wing of typical *Silbomyia* with R_{2+3} not very strongly bowed forwards and cell R_1 less strongly tapering than in *fuscipennis*, bend of *M* not very remote from wing margin. 21. Wing of ♂ *Amenia imperialis* Robineau-Desvoidy showing strong forward curvature of costa. 22. Ventral surface of costa between apices of *Sc* and R_1 in all Ameniinae other than *Silbomyia*. 23. Ventral surface of costa between apices of *Sc* and R_1 in *Silbomyia*.

Silbomyia mackerrasi sp. n.

DIAGNOSIS. T1+2 without median marginal setae ; wings uniformly dark brown ; postorbits silvery white ; interfrontal area 3·5 times as wide as parafrontal ; margin of lower calypter white.

♀. *Head* : Interfrontal area orange ; upper parts of parafrontals yellowish, rather shining and very thinly pollinose ; lower parts of parafrontals, parafacials and genae yellow with dense golden yellow pollinosity ; facial carina, antennal foveae and epistome yellow with thin pale yellow pollinosity ; postorbits silvery white ; postbuccae yellow, rather bare and shining. Parafrontal hair black ; hair of genae, lower occiput and postbuccae golden yellow. Upper occiput with thin but distinct even covering of whitish pollinosity over dark ground colour, not appearing metallic as insect is turned ; cerebrale orange. Vertex slightly broader than one eye, measured from above eye-vertex-eye ratio 9 : 11 : 9. Interfrontal area 3·5 times as wide as parafrontal at level of lower proclinate orbital seta. Facial carina short and ridge-like, equal in length to distance from lunula to anterior ocellus, 2·7 times as long as epistome. Gena 0·29 of eye-height. Parafacial about three times as wide as third antennal segment. Lower quarter of each facial ridge with a few minute pale yellow hairs just above the normal few black hairs near vibrissae. Postocellar setae very weak. Antennae pale orange, third segment 3·2 times as long as second segment ; seta on second segment very long and fine, about equal in length to third antennal segment and slightly shorter than arista. Palpi yellow. *Thorax* : blue-violet, with very slight traces of bluish green colouring especially under white spots of mesopleura ; hypopleura and pteropleura dark reddish brown with very faint violaceous reflections. Each mesopleuron and sternopleuron with large area of white pollinosity, that on mesopleuron forming bold spot from some points of view, but that on sternopleuron inconspicuous. Seen from behind mesonotum showing conspicuous white pollinosity on notopleura and thin less obvious white pollinosity anteriorly on prescutum and marginally on scutum. *Wings* : almost uniformly and evenly dark brown. Distance between bend of vein *M* and wing margin 3·1 times as great as that between *m-cu* and bend ; on vein *M* distance from *r-m* to *m-cu* 4·3 times as great as that between *m-cu* and bend. Costal spine well developed, about as long as cross-vein *r-m*. Calyptrae white, including margin of lower calypter. *Legs* : brownish black, femora with very slight violaceous tinge. *Abdomen* : mainly violet blue, mid dorsal area rather more greenish blue. T3 with an extensive covering of thin white pollinosity which extends round sides of tergite on to latero-ventral surfaces, appearance of this pollinosity shifting greatly with direction of light, pollen most conspicuous seen from behind ; T4 non-pollinose and rather strongly shining ; T5 with a broad band of white pollinosity on each side which starts near mid dorsum and extends round to ventral surface, white bands of each side only narrowly separated medially but not conspicuous dorsally from all points of view, in some lights almost disappearing. T1+2 without median marginal setae ; T3 with a single strong lateral marginal seta on each side (two in *fuscipennis*) ; T3 andT4 without median discal setae. Hair of T5 semi-erect, that of preceding tergites all fine and recumbent. *Measurements* : body length 11·2 mm., wing length 10·3 mm. [1 specimen].

♂. Unknown, but probably very like ♀ (head almost certainly not strongly sexually dimorphic).

MATERIAL EXAMINED. Holotype ♀, INDONESIA : Lombok, 29–30.vi.1929 (*I. M. Mackerras*). In Division of Entomology Museum, C.S.I.R.O., Canberra.

Distribution : At present known only from holotype specimen from Lombok Island, Indonesia.

AFFINITIES. *S. mackerrasi* sp. n. appears most closely related to *S. fuscipennis*, agreeing with this species in the very uniformly dark wings and bend of vein *M* unusually remote from wing margin ; it differs from *fuscipennis* by the characters

given in the key to species, most easily seen difference being the silvery white instead of yellow postorbits (a character which also distinguishes *mackerrasi* from *S. latigena*). There is a close superficial resemblance between *S. mackerrasi* and *S. sauteri* but the former differs from the latter by the evenly dark wings, lack of abdominal discal setae, longer costal spine and white border to lower calypter ; the last of these characters *mackerrasi* shares with *S. asiatica* and *S. metallica* but both of these species differ from *mackerrasi* in the unevenly infuscate wings and closer proximity of bend of vein *M* to wing margin as well as other characters.

Silbomyia latigena Enderlein, 1936

Stilbomyia latigena Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 438. Lectotype ♂, FORMOSA. In the Deutsches Entomologisches Institut, Berlin.

LECTOTYPE DESIGNATION : no holotype of this species was designated by Enderlein, and the type-material consists of a series of syntypes (in D. Ent. Inst., Zool. Mus. Humb. Univ., and B.M. Nat. Hist.), some labelled by Enderlein as " type " and others as " cotype ". One of the ♂ syntypes has been labelled and is here designated as lectotype, and the remaining syntypes have been labelled as paralectotypes.

DIAGNOSIS. T1 +2 without median marginal setae ; bend of vein *M* not strikingly remote from wing margin ; postorbits yellow or silvery yellow pollinose ; facial carina long and somewhat fusiform (especially in ♂), about four times as long as epistome and longer than distance from lunula to anterior ocellus, antennae sexually dimorphic and in ♂ about four and a half times as long as second segment.

♂. *Head* : Interfrontal area bright orange or yellow-orange ; parafrontals, parafacials, facial ridges, antennal foveae, facial carina, epistome and genae orange-yellow with golden yellow pollinosity ; postorbits all pale yellow or silvery yellow, occasionally rather silvery near the middle and brassy silver above and below, normally not strikingly contrasting in colour with yellow genae ; postbuccae yellow with orange-yellow hair ; genal hair all golden yellow. Upper occiput slightly metallic greenish to violaceous black, only appearing thinly yellowish grey pollinose in certain lights ; cerebrale orange. Eye-vertex-eye ratio about 6 : 9 : 6, vertex very distinctly broader than an eye viewed from above. Interfrontal area very broad, 3·3–3·6 times as wide as a parafrontal. Facial carina long and narrow, slightly pinched in inwardly and a little fusiform in shape, the carina about 1·1 times as long as distance from lunula to anterior ocellus and about 3·5–4·2 times as long as epistome. Gena about one-fifth (0·20–0·22) of eye-height. Parafacial about 1·75 times as wide as third antennal segment ; facial ridges nearly straight in profile, with fine setulae for about one third of their length above vibrissae. Postocellar setae strongly developed, curved and strongly divergent as the ocellar setae. Antennae orange, third segment 4·4–4·6 times as long as second segment ; seta on second segment shorter than arista ; arista equal in length to third antennal segment. Palpi yellow. *Thorax* : usually violet or blue-violet, but colour ranging from dark green through blue-green to dark blue and violet, slightly metallic ; hypopleura, pteropleura and anterior parts of sternopleura somewhat reddish. Mesonotal pollinosity not evident to naked eye except on extreme anterior margin, but in certain lights by microscopical examination thin white pollinosity visible on all of prescutum, humeral calli, notopleura, area of supra-alar setae, and post-alar calli ; mesopleuron with a conspicuous area of dense white pollen, sternopleuron with inconspicuous white pollinosity visible in some lights. *Wings* : dark brown infuscate, the infuscation heaviest along the veins and slightly weaker in the cells. Bend of vein *M* not remote from wing margin (Text-fig. 20)

distance from margin to bend 1·75–2·0 times that between the bend and cross-vein *m-cu* ; on vein *M* distance from *r-m* to *m-cu* about 3·25 times that between *m-cu* and bend ; veins R_{2+3} and R_{4+5} not conspicuously bowed forward. Costal spine short. Entire margin of lower calypter very dark brown and conspicuously contrasting with white disc of calypter. *Legs* : black, fore femora and to a lesser extent other femora somewhat violaceous ; tibiae slightly brownish. *Abdomen* : unicolorous with the thorax, ranging from dark green to violet but most often violet-blue ; in greenish or bluish specimens very narrow darker bands are evident at junctions of the tergites. Abdomen dorsally appearing more or less non-pollinose to naked eye, but in fact T3 is rather densely and evenly white pollinose seen from behind in microscopical examination, T4 shining and without pollinosity, T5 ventro-laterally with narrow bands of white pollinosity visible in some lights but these bands not extending on to dorsum of the tergite. T1+2 without median marginal setae ; T3 with two lateral marginal setae on each side ; T3 and T4 without median discal setae. Hair of T3 and T4 mainly rather fine and recumbent, but erect and slightly spiniform on mid-line of T3 and on median quarter or third of T4 ; hair of T5 long and erect. ♂ hypopygium closely similar to *S. fuscipennis*. *Measurements* : body length 14·1 mm. (range 12·2–16·3 mm.), wing length 11·6 mm. (range 9·5–13·7 mm.) [20 specimens].

♀. Generally like the ♂ but differing slightly in details of the head : facial carina broader than in ♂, not at all laterally compressed or spindle-shaped, somewhat rounded on outer edge, the carina about 2·9–3·25 times as long as epistome and a little shorter than distance from lunula to anterior ocellus ; third antennal segment shorter than in ♂, 3·6–3·8 times as long as second segment. Gena about one-third (0·33–0·35) of eye-height, parafacial nearly three times as wide as third antennal segment. Vertex slightly wider than in ♂, more conspicuously broader than an eye viewed from above. Hair on middle parts of intermediate abdominal tergites not spiniform and erect as in ♂, but recumbent as on rest of these tergites ; hair of T5 erect as in ♂ but shorter, finer and sparser. Postorbits more conspicuously yellow pollinose than in ♂. *Measurements* : body length 13·5 mm. (range 11·2–16·8 mm.), wing length 11·4 mm. (range 9·1–13·5 mm.) [20 specimens].

Material examined. Lectotype ♂, Formosa : Tainan, iv.1910 (*Sauter*). Paralectotypes : Formosa : 1 ♂, 4 ♀♀, data as for lectotype (D. Ent. Inst.) ; 1 ♂, 2 ♀♀, Formosa I. (*Sauter*) (D. Ent. Inst.) ; 1 ♂, 1 ♀, Yamo no Taiko, ix.1908 (*H. Sauter*) (D. Ent. Inst.) ; 3 ♀♀, Kanshizei, v.1908 (*Sauter*) (D. Ent. Inst. & B.M. Nat. Hist.) ; 1 ♀, Takao, ix.1907 (*H. Sauter*) (Zool. Mus. Humb. Univ.) ; 1 ♂, 1 ♀, Toyenmongai bei Tainan, v.1910 (*Rolle*) (Zool. Mus. Humb. Univ.) ; 1 ♂, 3 ♀♀, Kosun, v.1908 (*Sauter*) (D. Ent. *Inst.*) ; 1 ♂, Koshun, v.1908 (*Sauter*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Koshun, viii.1908 (*Sauter*) (D. Ent. Inst.) ; 1 ♀, Kankau, Koshun, 7.xi.1912 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♂, Kankau, Koshun, 7.viii.1912 (*H. Sauter*) (Zool. Mus. Humb. Univ.) ; 1 ♂, 1 ♀, Kankau, ix.1912 (*H. Sauter*) (Zool. Mus. Humb. Univ.) ; 1 ♂, Formosa (Zool. Mus. Humb. Univ.).

Formosa : 10 specimens of *S. latigena* labelled erroneously by Enderlein as "type" or " cotype " of " Stilbomyia sauteri End. " (7 specimens), and " Stilbomyia sauteri var. viridis End. " (3 specimens), data as follows : 1 ♂, nördl. Paiwan Distr., Paroe, 7.ix.1912 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♀, Takao, 19.i.1908 (*H. Sauter*) (Zool. Mus. Humb. Univ.) ; 1 ♀, Kosempo, 31.i.1908 (*H. Sauter*) (Zool. Mus. Humb. Univ.) ; 2 ♂♂, Formosa I. (*Sauter*) (D. Ent. Inst. & Zool. Mus. Humb. Univ.) ; 2 ♂♂, Koshun, viii.1908 (*Sauter*) (D. Ent. Inst.) ; 1 ♂, Kankau, Koshun, 7.xi.1912 (*H. Sauter*) (Zool. Mus. Humb. Univ.) ; 1 ♂, 1 ♀, Kankau, Koshun, 7.viii. and 7.xi.1912 (*H. Sauter*) (D. Ent. Inst.). Two specimens labelled by Enderlein as " Stilbomyia latigena var. viridis—cotype Enderl. ♀ " (unpublished varietal name of *latigena*),

data as follows : 1 ♀, Koshun, viii.1908 (*Sauter*) and 1 ♀, Kankau, Koshun, 7.viii.1912 (*H. Sauter*) (D. Ent. Inst.).

Each specimen listed above bears an identity label in Enderlein's writing. A further 30 specimens of Sauter's material have been seen which are not labelled by Enderlein ; there is no evidence that Enderlein saw this additional material, which I have therefore not considered to be part of the syntypic series and have not labelled as paralectotypes. Data are as follows : FORMOSA : 1 ♂, nördl. Paiwan Distr., Paroe, x.1912 (*H. Sauter*) (B.M. Nat. Hist.) ; 1 ♀, nördl. Paiwan Distr., Paroe, 7.ix.1912 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♂, nördl. Paiwan Distr., Paroe, 7.ix.1912 (*H. Sauter*) (U.S. Nat. Mus.) ; 2 ♀♀, Chipun, Puyuma Distr., vii.1912 (*H. Sauter*) (D. Ent. Inst. and B.M. Nat. Hist.) ; 1 ♀, Fuhosho, vii.1909 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♀, Kosempo, iv.1908 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♀, Kanshirei, v.1908 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♂, Formosa I. (*Sauter*) (D. Ent. Inst.) ; 2 ♂♂, 1 ♀, Sokutsu, ix.1912 (*H. Sauter*) (D. Ent. Inst. and B.M. Nat. Hist.) ; 1 ♂, Tainan, iv.1910 (*Sauter*) (D. Ent. Inst.) ; 1 ♂, Koshun, vii.1909 (*Sauter*) (D. Ent. Inst.); 1 ♂, Koshun, vii.1908 (*Sauter*) (B.M. Nat. Hist.) ; 1 ♀, Koshun, 7.viii.1912 (*H. Sauter*) (B.M. Nat. Hist.) ; 2 ♂♂, 3 ♀♀, Koshun, v. and viii.1908 (*Sauter*) (D. Ent. Inst.) ; 2 ♂♂, 1 ♀, Kankau, Koshun, ix. and 7.xi.1912 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♀, Kankau, Koshun, iv.1912 (*H. Sauter*) (U.S. Nat. Mus.) ; 1 ♂, Kankau, ix.1912 (*H. Sauter*) (U.S. Nat. Mus.) ; 1 ♂, 3 ♀♀ (*Sauter*) (Zool. Sammlung. Munich).

Other material : FORMOSA : 4 ♀♀, 15.x.1910 (*H. Rolle*) (B.M. Nat. Hist.) ; 1 ♀, Koannania, 22.vii.1908 (B.M. Nat. Hist.) ; 1 ♀, N. Formosa, Kushaku, v.1903 (*Haberer*) (Zool. Sammlung. Munich) ; 3 ♂♂, Tainan (B.M. Nat. Hist., Zool. Sammlung. Munich and Staatl. Mus. Stuttgart) ; 1 ♀, " Japan ", Formosa, Shinkwa, 16.x.1926 (*S. Takano*) (U.S. Nat. Mus.) ; 1 ♀, Formosa (no other data) (*ex coll. Brunetti*) (B.M. Nat. Hist.).

Distribution : *S. latigena* is confined to the island of Formosa, where it is evidently common and occurs in company with the closely related *S. sauteri* Enderlein. The specimen collected by the Japanese dipterist Professor Takano, now in the U.S. National Museum and labelled " JAPAN, Formosa, Shinkwa ", is from Formosa ; it was collected in 1926 when Formosa formed part of the Japanese Empire and the word " Japan " on the label indicates that the specimen was collected in one of the then Japanese islands. The genus *Silbomyia* is absent from Japan.

AFFINITIES. Most closely allied to *S. fuscipennis* and *S. sauteri*. From *S. fuscipennis* it is distinguished by the venational characters mentioned in the key, and also by the shorter facial carina and antennae, and broader vertex ; the abdomen also differs from that in *S. fuscipennis*, there being no white pollinosity on T4, and the hair on T5 being erect (in ♂ erect also in middle of T3 and T4), whereas the abdominal hair in *S. fuscipennis* is entirely recumbent. *S. latigena* is easily distinguishable from *S. sauteri* by the yellow or silvery yellow pollinose postocular stripe (all bright silver in *sauteri*), by the much longer more fusiform facial carina and longer ♂ antennae, and by the absence of median discal setae on T3 and T4 of the abdomen (such setae normally present in *sauteri*). The differences from *S. sauteri* apply also to *S. hoeneana* Enderlein.

Silbomyia sauteri Enderlein, 1936

Stilbomyia sauteri Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 439. Lectotype ♂, FORMOSA. In the Zoologisches Museum der Humboldt-Universität, Berlin.

Stilbomyia sauteri var. *viridis* Enderlein, 1936, *Veröff. dtsch. KolonMus.* Bremen **1** : 439. Lectotype ♂, FORMOSA. In the Zoologisches Museum der Humboldt-Universität, Berlin.

LECTOTYPE DESIGNATIONS: Enderlein did not designate holotype specimens for *S. sauteri* or for *S. sauteri* var. *viridis*, type-material of both of which consists of a series of syntypes variously labelled as ' type ' or ' cotype '. A ♂ from the syntype series of *S. sauteri*, and a ♂ from the syntype series of *S. sauteri* var. *viridis*, have been labelled and are here designated as lectotypes ; remaining syntypes have been labelled as paralectotypes.

DIAGNOSIS. At least one and usually both of intermediate abdominal tergites with a pair or more of strong spiniform discal setae *and* median marginal setae absent on T1+2 ; facial carina short and roof-ridge like, not at all fusiform ; post-orbits silvery white ; entire margin of lower calypter dark brown.

♂. *Head* : Interfrontal area orange or yellow-orange ; parafrontals, parafacials, facial ridges, antennal foveae, facial carina, epistome and genae orange-yellow with golden yellow pollinosity ; postorbits bright silver pollinose, conspicuously contrasting with yellow genae and postbuccae ; postbuccae yellow with golden yellow hair ; genal hair all golden yellow. Upper occiput dark greenish to violaceous, metallic in some lights but with very thin greyish pollinosity ; cerebrale orange. Eye-vertex-eye ratio : 5 : 7 : 5. Interfrontal area very broad, 3·3–3·6 times as wide as a parafrontal. Facial carina short and rather broad, more or less ridge-like and not at all laterally compressed or fusiform, the carina conspicuously shorter (0·75–0·85) than the distance from lunula to anterior ocellus and about 2·8–3·3 times as long as epistome. Gena two-ninths (0·22) of eye-height. Parafacial nearly two and a half times as wide as third antennal segment ; facial ridges very slightly concave in profile, with fine setulae extending for a little over a quarter of the length above vibrissae. Postocellar setae variable, sometimes strong but more often only moderately or weakly developed, occasionally two pairs. Antennae pale orange, third segment relatively short, 3·4–3·5 times as long as second segment ; seta on second antennal segment equal in length to arista ; arista distinctly longer (about 1·3 times) than third antennal segment. Palpi yellow. *Thorax* : varying from green to violet, but most often greenish blue to violaceous blue, mesonotum metallic, scutellum sometimes more strongly violet than scutum and prescutum ; hypopleura and pteropleura in part somewhat reddish. Mesonotum with whitish pollinosity visible to naked eye only on anterior margin of prescutum and on notopleural areas, but microscopic examination from behind showing thin whitish pollinosity also on humeral calli, most of prescutum and post-alar calli, and very conspicuously in some lights between *post ia* setae and supra-alar setae ; mesopleura and sternopleura with large conspicuous areas of white pollinosity. *Wings* : generally similar to those of *S. latigena* but vein proportions by measurement slightly different. Dark brown infuscate, most strongly browned along the veins, paler in the cells and to the hind margin. Distance from wing margin to bend of *M* 1·4–1·7 times as great as that between bend and *m-cu* ; on vein *M* distance between *r-m* and *m-cu* 2·4–3·0 (usually 2·7–2·9) times as great as that between *m-cu* and the bend. Costal spine short. Entire border of lower calypter dark brown. *Legs* : black except for the femora dark metallic greenish black to violaceous. *Abdomen* : unicolorous with the thorax, ranging from bright green to violet, most often violaceous blue ; in naked eye appearance with a suggestion of narrow darker intersegmental bands. T3 with white pollinosity conspicuous on most of its surface when viewed from behind dorsally, the pollinosity extending round the sides of the tergite to form narrower bands of bright silvery pollinosity visible in some lights ventro-laterally ; T4 rather shining and non-pollinose ; T5 dorsally somewhat shining and non-pollinose but ventro-laterally and laterally with areas of silvery white pollen conspicuous in

some lights, the appearance shifting ; pollinosity of T3 and T5 not at all conspicuous to naked eye. T1+2 without median marginal setae ; T3 with one or two lateral marginal setae on each side ; T3 almost always with strong spiniform median discal setae, usually one pair but occasionally two pairs, or sometimes rather irregular in number and haphazardly arranged ; T4 usually with, sometimes without, one pair of strong median discal setae. Hair of T3 and T4 long, strong and erect, conspicuously spiniform, on the middle of the tergites, less strong and more recumbent laterally, the spiniform hair especially long and strong on mid-line of T3 ; hair of T5 long and erect, finer than on preceding tergites and not conspicuously spiniform. ♂ hypopygium as in Text-figs. 33 and 36. *Measurements* : body length 13·3 mm. (range 11·3–15·1 mm.), wing length 10·5 mm. (9·6–12·4 mm.) [10 specimens].

♀. Almost identical with ♂, except for very slight differences as follows : gena a little broader, nearly one-third (0·3) of eye-height ; parafacial broader, about three and a half times as wide as third antennal segment ; third antennal segment a little shorter, 3·0 times as long as second segment. Facial carina not noticeably sexually dimorphic (cf. *latigena*). *Measurements* : body length 12·1 mm. (range 10·1–14·2 mm.), wing length 10·7 mm. (range 9·0–12·0 mm.) [14 specimens].

MATERIAL EXAMINED. Lectotype ♂ (*S. sauteri* Enderlein), FORMOSA : Kosempo, 31.i.1908 (*H. Sauter*) ; Lectotype ♂ (*S. sauteri* var. *viridis* Enderlein), FORMOSA : Suisharyo, x.1911 (*H. Sauter*). Paralectotypes of *S. sauteri* : FORMOSA : 1 ♂, Kosempo, iv–v.1908 (*H. Sauter*) (B.M. Nat. Hist.) ; 1 ♀, Kosempo, iv–v.1908 (*H. Sauter*) (Zool. Mus. Humb. Univ.) ; 2 ♀♀, Toyenmongai bei Tainan, v.1910 (*Rolle*) (Zool. Mus. Humb. Univ.) ; 1 ♂, Tainan, iv.1910 (*Sauter*) (D. Ent. Inst.) ; 1 ♀, Tainan, iv.1910 (*Sauter*) (B.M. Nat. Hist.) ; 1 ♂, Kankau, Koshun, 7.viii.1912 (*H. Sauter*) (B.M. Nat. Hist.) ; 1 ♀, Koshun, viii.1908 (*Sauter*) (D. Ent. Inst.) ; 1 ♀, Paroe, nördl. Paiwan Distr., 7.ix.1912 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♀, Formosa (D. Ent. Inst.). Paralectotypes of *S. sauteri* var. *viridis* : FORMOSA : 1 ♀, Suisharyo, x.1911 (*H. Sauter*) (D. Ent. Inst.) [not a green specimen although labelled *viridis* by Enderlein] ; 1 ♂, 1 ♀, Koshun, v. & viii.1908 (*Sauter*) (D. Ent. Inst.) ; 1 ♀, Kankau, ix.1912 (*H. Sauter*) (Zool. Mus. Humb. Univ.).

FORMOSA : 1 ♂, 1 ♀, Yamo no Taiko, ix.1908 (*H. Sauter*) (B.M. Nat. Hist. & D. Ent. Inst.) ; 1 ♀, Polisha, xii.1908 (*H. Sauter*) (D. Ent. Inst.) ; 1 ♀, Kanshizei, v.1908 (*Sauter*) (D. Ent. Inst.) ; 1 ♂, 2 ♀♀, Formosa (no other data) (*ex. coll. Brunetti*) (B.M. Nat. Hist.) ; 1 ♂, Formosa I. (*Sauter*) (D. Ent. Inst.) ; 2 ♂♂, Suisharyo, x.1911 (*Sauter*) (B.M. Nat. Hist. & D. Ent. Inst.) ; 3 ♂♂, Tainan (Zool. Sammlung, Munich & B.M. Nat. Hist.) ; 2 ♂♂, 1 ♀, Formosa (*Sauter*) (Zool. Sammlung, Munich) ; 1 ♂, Formosa (*Sauter*) (Staatl. Mus. Stuttgart) ; 1 ♀, Koshun, viii.1908 (*Sauter*) (B.M. Nat. Hist.) [green specimen] ; 1 ♀, Suisharyo, x.1911 (*H. Sauter*) (D. Ent. Inst.) [green specimen] ; 1 ♂, Paroe, nördl. Paiwan Distr., 7.ix.1912 (*H. Sauter*) (D. Ent. Inst.) [green specimen].

Note : 10 specimens labelled by Enderlein as ' type ' or ' cotype ' of *S. sauteri* and *S. sauteri* var. *viridis* belong to *S. latigena* Enderlein and are therefore listed among the material examined of *S. latigena* ; these specimens are nonetheless paralectotypes of *S. sauteri* and *S. sauteri* var. *viridis*.

Distribution : Occurs only in Formosa, together with *S. latigena* Enderlein.

AFFINITIES. Very closely related to *S. hoeneana* Enderlein from the mainland of China, with a very similar facial carina and silvery white postocular stripe. It is

possible that *S. hoeneana* and *S. sauteri* are conspecific, for the morphological distinctions are certainly slight, but on the evidence available at present it appears best to recognise the two species as distinct. *S. sauteri* is distinguished from *S. hoeneana* by the broader interfrontal area (about three and a half times as wide as a parafrontal), by the presence in almost all specimens of median discal setae on at least one and usually both intermediate abdominal tergites, and normally by the violet-blue coloration (*S. hoeneana* always green in the material seen). *S. sauteri* is easily distinguished from *S. latigena*, also from Formosa, by the short facial carina (not at all fusiform as in *latigena*) and silver-white postorbits.

Discussion. With present evidence it is not possible to accord separate systematic status to the green-coloured form of this species (var. *viridis* of Enderlein). Green specimens appear to be conspecific with the commoner violet-blue specimens, and specimens with this different coloration have been seen with identical data ; the difference is certainly not subspecific in the absence of allopatry. It is worth noting however that the wings are slightly shorter in relation to the body length in green specimens than in violet-blue specimens, the wing length being about ten-thirteenths of the body length in bright green individuals and eleven or twelve-thirteenths of the body length in blue to violet specimens. As yet there is insufficient material available to assess the significance of this apparent distinction.

Silbomyia hoeneana Enderlein, 1936

Stilbomyia hoeneana Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 439. Lectotype ♂, CHINA. In the Zoologisches Museum der Humboldt-Universität, Berlin.

Lectotype Designation : the available type-material of *S. hoeneana* comprises eight syntypes collected by Dr. Mell in China, seven labelled by Enderlein as ' Type ' and one (in Staatl. Mus. Stuttgart) as ' Cotype '. A ♂ syntype in Zool. Mus. Humb. Univ. has been labelled and is here designated as lectotype, and the other syntypes have been labelled as paralectotypes (three in Zool. Mus. Humb. Univ., two in B.M. Nat. Hist. and one in D. Ent. Inst.). In the original description Enderlein mentions two specimens from Nanking in addition to the material collected by Dr. Mell ; the whereabouts of these two syntypes has not been traced.

Diagnosis. Very similar to *S. sauteri* but lacking median discal setae on intermediate abdominal tergites.

♂. *Head* : Interfrontal area orange or orange-yellow ; parafrontals, parafacials, facial ridges, antennal foveae, facial carina, epistome and genae yellow with golden yellow pollinosity ; postorbits with blackish ground colour and dense silvery pollinosity conspicuously contrasting with yellow genae. Parafrontal hair black, hair of genae long and yellow. Upper occiput dark greenish metallic in certain lights, thinly whitish pollinose ; cerebrale orange. Eye-vertex-eye ratio about 5 : 7 : 5. Interfrontal area very broad, 3·3–3·5 times as wide as a parafrontal at level of lower proclinate orbital seta. Facial carina short and broad, rather ridge-like and not at all fusiform, carina slightly shorter (0·9) than distance from lunula to anterior ocellus and 2·8–3·0 times as long as epistome. Gena about two-ninths (0·22) of eye-height. Parafacial two and a half times as wide as third antennal segment ; facial ridges distinctly concave in profile with fine hairs above vibrissae confined to lower quarters. Postocellar setae usually strongly developed, sometimes two pairs. Antennae pale orange, third segment 3·7–3·9 times as long as

second segment ; seta on second segment long and strong, about as long as arista ; arista much longer than third antennal segment. Palpi yellow. *Thorax* : mesonotum usually emerald-green, occasionally with cupreous reflections, violaceous blue in one specimen seen ; scutellum sometimes more bluish than mesonotum ; sides of thorax green or bluish green, hypopleura and pteropleura more reddish brown with metallic greenish reflections. Dorsum with white pollinosity, conspicuous seen from behind, on humeral calli, notopleura, areas of supra-alar setae, prescutum and postalar calli. Mesopleura and sternopleura with usual large densely pollinose white spots. *Wings* : dark brown infuscate, the infuscation distinctly weaker in centres of cells and along hind margin. Distance from bend of vein *M* to wing margin 1·5–1·7 times as great as that between bend and *m–cu* ; on vein *M* distance from *r–m* to *m–cu* 2·6–3·5 times as great as that between *m–cu* and bend. Costal spine distinct, a little shorter than *r–m*. Margin of lower calypter dark brown, calyptrae otherwise white. *Legs* : black, femora with dark greenish metallic reflections. *Abdomen* : usually unicolorous with dorsum of thorax occasionally slightly more blue, colour usually emerald green but sometimes greenish blue, violet in one specimen seen. T3 with white pollinosity on most of dorsum, conspicuous from behind, the pollinosity extending round the sides of the tergite to form conspicuous silvery white median bands ventro-laterally ; T4 non-pollinose ; T5 with a pair of large white pollinose areas ventro-laterally which extend round sides of tergite just on to dorsum, appearance of these spots shifting with the light. T1+2 without median marginal setae ; T3 with a variable number of lateral marginal setae on each side, usually two but occasionally three or four, sometimes one strong seta and one much weaker one ; T3 and T4 without median discal setae. Hair of T3 and T4 sometimes mostly recumbent but sometimes almost all semi-erect or erect, conspicuously thickened and spiniform on median dorsal area of each intermediate tergite ; hair of T5 long and erect, sometimes very slightly spiniform but always finer than on preceding tergites, ♂ hypopygium as in *S. sauteri* (Text-fig. 33). *Measurements* : body length 14·6 mm. (range 12·9–16·8 mm.), wing length 12·4 mm. (range 10·5–14·9 mm.) [11 specimens].

♀. Very similar to ♂, antennae and facial carina not noticeably sexually dimorphic. Gena and parafacial broader than in ♂, former about one-third (0·33–0·36) of eye-height, latter about three and a half times as wide as third antennal segment. *Measurements* : body length 15·0 mm. (range 13·2–17·4 mm.) ; wing length 13·4 mm. (range 11·7–15·9 mm.) [18 specimens].

MATERIAL EXAMINED. Lectotype ♂, CHINA : Canton, Tsha-jiu-san, 14.vii.1910 (*S. V. Mell*). Paralectotypes : CHINA : 1 ♀, Canton, Tsha-jiu-san, 14.vii.1910 (*S. V. Mell*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Tsha-jiu-san, vii–viii.1910 (*S. V. Mell*) (Zool. Mus. Humb. Univ.) ; 2 ♀♀, Canton (*S. V. Mell*) (D. Ent. Inst. & Zool. Mus. Humb. Univ.) ; 2 ♂♂, Canton (*S. V. Mell*) (B.M. Nat. Hist. & Staatl. Mus. Stuttgart).

CHINA : 1 ♀, Canton, 14.vii.1910 (Zool. Sammlung. Munich) ; 1 ♀, Kiukiang, vii.1887 (*Pratt*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Szechuen, Mt. Omei, Si Gi Pin, viii.1925 (*D. C. Graham*) (U.S. Nat. Mus.) ; 3 ♀♀, Szechuen, Mt. Omei, Si Gi Pin, 6–7,000 ft., 10–22.viii.1934 (*D. C. Graham*) (U.S. Nat. Mus. & B.M. Nat. Hist.) ; 1 ♀, Szechuen, Mt. Omei, Si Gi Pin, 6–7,000 ft. (*D. C. Graham*) (U.S. Nat. Mus.) ; 1 ♂, 1 ♀, Szechuen Mt. Omei, Shin Kai Si, 4,400 ft. (*D. C. Graham*) (B.M. Nat. Hist. & U.S. Nat. Mus.) ; 1 ♂, Szechuen, Mt. Omei, Shin Kai Si, 4,400–5,000 ft., 20–26.viii.1934 (*D. C. Graham*) (U.S. Nat. Mus.) ; 1 ♂, Szechuen, Mt. Omei, 4,400–7,000 ft. 20–22.viii.1934 (*D. C. Graham*) (U.S. Nat. Mus.) ; 1 ♀, Szechuen, Mt. Omei, 4–6,000 ft., 10–22.viii.1934 (*D. C. Graham*) (U.S. Nat. Mus.) ; 1 ♀, Szechuen, 1922 (*D. C. Graham*) (U.S. Nat. Mus.) ; 4 ♀♀, Nanking, 22.vii.1924 (*C. Y. Wong*) (U.S. Nat. Mus.) ; 2 ♂♂, Nanking, 23.vii.1924 (*H. A. Jaynes*) (U.S. Nat. Mus. & B.M. Nat. Hist.) ; 2 ♂♂, 1 ♀, Kuling, 3.vi.–8.vii.1926 (*C. Y. Wong*) (U.S. Nat. Mus.) ; 1 ♂, Kuling, 7.vi.1926 (*C. Y. Wong*) (B.M. Nat. Hist.) ; 1 ♀, Hangchow, Mokanshan, ex foliage, 20.vii.1924 (*J. F.*

Illingworth) (U.S. Nat. Mus.) ; 1 ♂, labelled ' China, Honan Isld. ' and ' Hong Kong ', no other data (Staatl. Mus. Stuttgart).

Note : some of the specimens listed above in U.S. Nat. Mus. are labelled as type and paratypes of ' Stilbomyia chinensis Malloch ' ; this is an unpublished manuscript name.

In addition to the foregoing material I have seen a small specimen (in U.S. Nat. Mus.) in which the third antennal segment bears two small black setulae basally on the outer surface but in other respects appears to be a typical specimen of *S. hoeneana*: Malloch has labelled this specimen ' Stilbomyia chinensis v. seticornis, Type ' but this is an unpublished manuscript name. For the present this specimen may be tentatively identified as *S. hoeneana*, and its data are identical with those of a normal specimen of this species (♀, CHINA : Nanking, 23.vii.1924 (*H. A. Jaynes*)).

Distribution : Known only from southern China.

AFFINITIES. Very closely allied to *S. sauteri* Enderlein, and perhaps not specifically distinct : all specimens of *hoeneana* seen (from China) lack median discal setae on the intermediate abdominal tergites, whereas these setae are present on at least one of the intermediate tergites in material of *sauteri* (all from Formosa). In the absence of any evidence to the contrary it seems best to regard the two forms as distinct species for the present.

Silbomyia asiatica sp. n.

DIAGNOSIS. T1+2 without median marginal setae ; lower calypter with white margin ; interfrontal area 2·4–2·8 times as wide as parafrontal ; facial carina and antennae not sexually dimorphic.

♂. *Head* : Interfrontal area orange yellow ; upper parts of parafrontals semi-translucent yellowish, rather shining and non-pollinose ; lower parafrontals and parafacials densely yellowish white pollinose, colour more yellowish inwardly, in some lights the parafacials appearing rather brightly shining white ; facial carina, antennal foveae and epistome yellow with thin yellowish white pollinosity ; genae yellow with dense golden yellow pollinosity ; postorbits densely silvery white pollinose over dark ground colour, pollinosity thinner on upper end of each postorbit which appears slightly shining in certain lights. Parafrontal hair black ; hair of genae golden yellow. Upper occiput dark metallic greenish from some points of view but evenly covered with white pollinosity ; cerebrale orange. Vertex by measurement equal in width to an eye viewed from above. Interfrontal area 2·4–2·8 times as wide as a parafrontal at level of lower proclinate orbital seta. Facial carina short and ridge-like, sometimes widened below, 2·3–2·6 times as long as epistome and distinctly shorter than (0·8) distance from lunula to anterior ocellus. Gena slightly less than (0·22–0·24) a quarter of eye-height. Parafacial about 2·2–2·5 times as wide as third antennal segment. Facial ridges slightly concave in profile, fine hairs above vibrissae confined to lower quarter of each ridge. Postocellar setae weakly developed. Antennae orange, third segment 3·3 times as long as second segment ; seta on second segment long and strong, about equal in length to arista, latter longer than third antennal segment. Palpi yellow. *Thorax* : green, sometimes with slight bluish or cupreous tinge on mesonotum, mesopleura and sternopleura with the usual large white pollinose spots ; pteropleura and hypopleura reddish brown with violaceous reflections ; mesonotum conspicuously white pollinose marginally, the pollinosity especially evident on notopleura and areas of supra-alar setae, prescutum and postalar calli also whitish pollinose. *Wings* : dark brown infuscate, the infuscation concentrated broadly along the veins and obviously paler in middle

of cells and on hind margin. Distance between bend of vein *M* and wing margin 1·8–2·1 times as great as that between *m–cu* and bend ; on vein *M* distance from *r–m* to *m–cu* 3·0–3·5 times as great as that between *m–cu* and bend. Costal spine well developed but shorter than *r–m*. Calyptrae white, including margin of lower calypter. *Legs* : blackish, tibae dark brown, femora with dark metallic greenish or bluish violet reflections. *Abdomen* : brilliant metallic green to bluish green, sometimes with a coppery tinge, more blue or violaceous ventrally. T3 appearing non-pollinose to naked eye but dorsally with thin white pollinosity visible from behind under microscopic examination, each ventro-lateral surface with a broad median band of shining white pollinosity conspicuous to naked eye ; T4 non-pollinose and rather brilliantly shining dorsally, sometimes with small traces of whitish pollinosity ventro-laterally ; T5 with a pair of large white pollinose spots ventra-laterally, the spots extending round the sides of the tergite on to the latero-dorsal surfaces and their appearance shifting with the light. T1+2 without median marginal setae ; T3 with one lateral marginal seta on each side ; T3 and T4 without discal setae. Hair of intermediate tergites recumbent laterally but erect and slightly thickened on median areas ; hair of T5 semi-erect to erect, finer than on preceding tergites. ♂ hypopygium similar to *fuscipennis*. *Measurements* : body length 11·3 mm. (range 9·2–12·7 mm.), wing length 9·6 mm. (range 8·2–10·3 mm.) [4 specimens].

♀. Almost identical with ♂, differing in minor detail as follows : gena broader, 0·35 of eye-height ; parafacial broader, about 3·4 times as wide as third antennal segment ; antennae slightly shorter, third segment 2·7 times as long as second segment ; abdominal hair all recumbent. *Measurements* : body length 10·3, 13·7 mm., wing length 9·7, 11·7 mm. [2 specimens].

MATERIAL EXAMINED. Holotype ♂, THAILAND (SIAM) : Biserat, 18.x.1901 (*H. C. Robinson & N. Annandale*). In British Museum (Natural History), London. Paratypes : 2 ♂♂, data as for holotype except dates 19 & 20.x.1901 (B.M. Nat. Hist.) ; 2 ♂♂, 1 ♀, INDIA : Darjeeling District, Mungpoo, 21.v.1920 (*R. Senior-White*) (B.M. Nat. Hist.) ; 1 ♀, MALAYA : Malacca, Quedah (*v. d. Does de Bye*) (Rijksmus. Leiden).

Distribution : South-east Asia from India to Malaya.

AFFINITIES. *S. asiatica* sp. n. appears to be most closely related to *S. hoeneana* Enderlein and *S. metallica* sp. n. ; from *hoeneana* it is distinguished by the white margin to the lower calypter, by the narrower interfrontal area and smaller size, and from *metallica* by the much broader interfrontal area. From both these species it also differs in the shining creamy whitish appearance of the parafacials when seen from above. There is some resemblance to *S. sumba* sp. n. but *S. asiatica* sp. n. is at once distinguished from this species by the absence of median marginal setae on T1+2 and by the shorter facial carina and antennae.

Silbomyia metallica sp. n.

DIAGNOSIS. T1+2 without median marginal setae ; parafrontals unusually broad and interfrontal area only 1·4–1·7 times as wide as parafrontal at level of lower proclinate orbital seta ; margin of lower calypter white ; dorsal surfaces of T4 and T5 under high power examination completely smooth and brilliantly metallic.

♀. *Head* : Interfrontal area orange-yellow ; vertex and upper parts of parafrontals semi-translucent yellowish or orange-yellow, rather shining and scarcely at all pollinose ; lower parts of parafrontals, parafacials, genae, facial carina, antennal foveae and epistome yellow or orange yellow, pollinosity golden on lower parafrontals, parafacials and genae but thinner and paler yellowish on face ; postorbits densely silvery white pollinose, the pollinosity reaching to outer vertical setae and extreme upper ends of postorbits not at all metallic. Parafrontal hair

all black ; hair of genae golden yellow. Upper occiput thinly whitish pollinose, but appearing metallic green in some lights ; cerebrale orange. Vertex almost exactly equal in width to one eye seen from above, eye-vertex-eye ratio about 13 : 12 : 13. Interfrontal area 1·4–1·7 times as wide as a parafrontal at level of lower proclinate orbital seta, parafrontals therefore unusually broad and interfrontal area relatively narrow. Facial carina short and ridge-like, slightly widening ventrally, only 2·5–2·8 times as long as epistome and distinctly shorter than distance from lunula to anterior ocellus. Gena relatively broad, nearly one-third (0·31) of eye-height. Parafacial three times as wide as third antennal segment. Fine hairs above vibrissae confined to lower quarter of each facial ridge, facial ridges slightly but distinctly concave in profile. Postocellar setae weakly developed. Antennae orange, third segment 3·3–3·5 times as long as second segment ; seta on second segment long and strong, almost as long as whole antenna and longer than arista, latter longer than third antennal segment. Palpi yellow. *Thorax* : brilliant green with slight coppery or bluish tinge, mesopleura and sternopleura with usual large white spots of dense pollinosity ; hypopleura and pteropleura reddish brown with violaceous reflections ; mesonotum when viewed from behind showing very thin inconspicuous traces of whitish pollinosity around the margins, the pollinosity much less obvious than in other species in which such pollen is present. *Wings* : heavily infuscate very dark brown along the veins and paler brownish in cells and posteriorly. Distance between bend of vein *M* and wing margin 1·6 times as great as between *m–cu* and bend ; on vein *M* distance from *r–m* to *m–cu* 2·7–2·9 times as great as that between *m–cu* and bend. Costal spine small, much shorter than *r–m*. Calyptrae white, including posterior and outer margins of lower calypter. *Legs* : black, femora partly dark metallic bluish green. *Abdomen* : bright metallic green, somewhat coppery posteriorly and on ventral surface with broad violaceous hind margins to the tergites. Dorsal surfaces of T4 and T5 under high magnification quite smooth and polished, exceptionally brilliantly shining. T3 with a conspicuous broad median band of white pollinosity on latero-ventral surfaces, but with no white pollinosity visible on dorsum from any point of view ; T5 with usual pair of conspicuous spots of dense white pollinosity, mainly ventral in position but extending on to extreme sides of the tergite. T1+2 without median marginal setae ; lateral marginal setae of T3 single on each side ; T3 and T4 without median discal setae. Hair of dorsum entirely recumbent, including that on T5. *Measurements* : body length 11·7 mm. (range 10·9–12·6 mm.), wing length 10·5 mm. (range 9·8–11·2 mm.) [4 specimens].

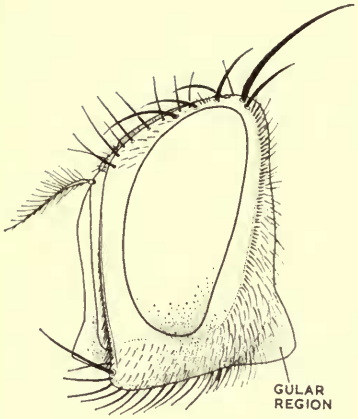
♂. Unknown. Probably very similar to ♀.

MATERIAL EXAMINED. Holotype ♀, INDONESIA : E. Borneo, Babidjoelan, approx. 4,000 ft., vi.1937. In British Museum (Natural History), London. Paratypes : 3 ♀♀, data and depository as for holotype.

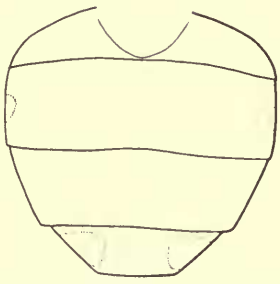
Distribution : At present known only from the four female specimens of the type-series from Borneo, and probably confined to Borneo where no other species of *Silbomyia* is known to occur.

AFFINITIES. *S. metallica* sp. n. appears to be most closely allied to *S. fulgida* (Bigot) and *S. sumba* sp. n. ; it is easily distinguished from both these species by the lack of median marginal setae on T1+2 by the proportions of the interfrontal area and parafrontals, by the white margin of the lower calypter, and by other minor differences.

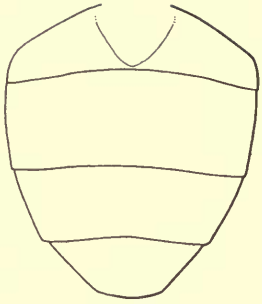
FIGS. 24–30. 24. Head of *Paraplatytropesa* gen. n. in profile showing prominent gular development. 25. Abdominal shape in *Amenia*. 26. Abdominal shape in *Stilbomyella*. 27. Abdomen of *Formosiomima nigromaculata* (Malloch) showing arrangement on T4 of separated pairs of marginal setae, remarkable pattern of black spots and weakness of sutures between tergites. 28. Profile of abdomen of ♂ *Platytropesa auriceps* Macquart. Figs. 29 and 30. Sternite 5 of ♂ of (29) *Platytropesa simulans* sp. n. and (30) *Platytropesa auriceps* Macquart.



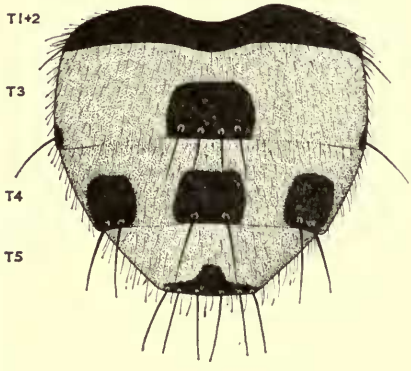
24



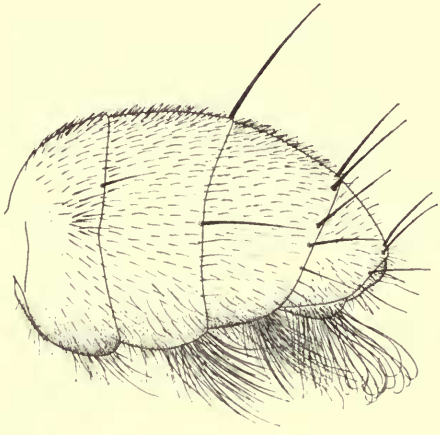
25



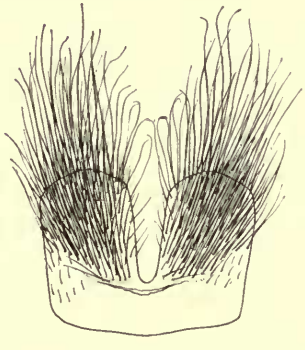
26



27



28



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30

PLATYTROPESA Macquart, 1851

Platytropesa Macquart, 1851, *Mém. Soc. Sci. Lille*, Année 1850 : 197, and *Diptères Exot. Suppl.* **4** : 224. [Spelling *Platytropeza* in *Diptères Exot. Suppl.* **4**, Index : 357]. Type-species : *Platytropesa auriceps* Macquart, 1851 [= *ruriceps*, by typographical error], by monotypy.

Liostiria Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen*, **1** : 440. Type-species : *Liostiria ralumensis* Enderlein, 1936 [= *Stilbomyella dubia* Malloch, 1935], by original designation. **syn. n.**

Diagnosis. Ventral surface of costa bare between apices of veins *Sc* and R_1. Head normal, gular region not produced. Fore tibia with one submedian *pv* seta and with two small *pd* setae (Text-fig. 11). Mid femur with two or more strong submedian *a* setae. Hind coxa setulose on postero-dorsal surface. Facial ridges with fine setulae extending more than half way (♂) or about half way (♀) up their length. Facial carina very strongly sexually dimorphic. Frons about equal in width in both sexes, ♂ eyes not approximated ; ♂ with outer vertical, prevertical and sometimes proclinate orbital setae. Inner vertical setae cruciate. Abdomen without white pollinose spots on T5. Sternites of ♂ abdomen with very long dense hair (Text-fig. 28), sternites of ♀ abdomen with spinous setae.

Discussion. *Platytropesa* is to some extent intermediate between *Silbomyia* Macquart and *Stilbomyella* Malloch, but the general facies and the long dense hair on the sternites of the ♂ suggest closer affinity with the latter genus ; the bare ventral surface of the costa between the apices of *Sc* and R_1 easily distinguishes *Platytropesa* from *Silbomyia*, but it agrees with this genus in the broad ♂ frons with outer vertical and prevertical setae and in having small *pd* setae on the fore tibia. The latter character distinguishes *Platytropesa* from *Stilbomyella* and *Paraplatytropesa* gen. n., both of which lack *pd* setae on the fore tibia ; the normal gular region of the head distinguishes it from *Paraplatytropesa*.

There is confusion in the literature concerning the name and type-locality of the type-species of *Platytropesa*. Macquart (1851) spelled the name *ruriceps* in the original description and cited the type-locality as " Océanie, Triton Bay ". Townsend (1931) pointed out that the type was labelled " *auriceps* " and therefore attributed the original spelling " *ruriceps* " to a typographical error ; the spelling " *ruficeps* " in Macquart's (1851) Index p. 357 to the 4th Supplement of his *Diptères Exotiques* is also a misprint. It appears certain that Macquart's name alluded to the golden yellow head, a character mentioned in his original description (' Tete d'un jaune doré '), and Townsend's (1931) emendation to *auriceps* is justified, especially as the type is labelled " *Platytropesa auriceps* ♀, n.g., n. sp., Macq." in Macquart's writing. There is therefore no evidence to support Paramonov's (1957, p. 62) emendation, based on remarks of Séguy, to *rubriceps*.

Triton Bay, type-locality of *auriceps*, lies on the southern coast of the narrow western ' neck ' of New Guinea, an area where *P. auriceps* will probably prove to be quite common when sufficient collecting has been done. Townsend (1935, 1937) erroneously, and without any explanation, cited the type-locality of *auriceps* as the Paracel Islands, and Enderlein (1936, p. 445) repeated this mistake. *Platytropesa* is not known from the Paracel Islands in the China Sea or from anywhere near there,

and Macquart's original citation of Triton Bay quite certainly means the inlet still known by that name in western New Guinea.

DISTRIBUTION (map 1, p. 123). *Platytropesa* occurs throughout New Guinea and its neighbouring islands, including Morotai in the Moluccas, Misoöl, Waigeo, Biak, the Aru Islands, and the Bismarck Archipelago (New Britain and New Ireland) ; it occurs also in northern Queensland, including Palm Island. It is not yet known from Halmahera, Ceram, and Obi but almost certainly occurs in these islands of the Molucca group.

KEY TO THE SPECIES

1 Head in facial view with inner margins of eyes slightly but distinctly angulate near level of lunula (Text-fig. 16). Lower calypter dark brown on about apical fifth (♂) or quarter (♀). Mesolobe of ♂ hypopygium curved in profile and rounded at tip (Text-fig. 39). Hair of ♂ sternite 5 very long and largely curved downwards and inwards apically (Text-figs. 28 and 30). ♂ facial carina 5·3–6·8 times as long as epistome. ♂ with or without proclinate orbital setae 2

– Head in facial view with inner margins of eyes slightly but evenly curved, not at all angulate (Text-fig. 15). Lower calypter dark brown on about apical third to two-fifths (♂) or half (♀). Mesolobe of ♂ hypopygium rather straight in profile, slightly truncate apically with trace of hook (Text-fig. 38). Hair of ♂ sternite 5 shorter and not conspicuously turned downwards or inwards apically (Text-fig. 29). ♂ facial carina 4·5–4·8 times as long as epistome. ♂ without proclinate orbital setae . . . . . ***P. simulans*** sp. n. (p. 89)

2 Mesopleuron shining, without large white pollinose spot. ♂ without or with one pair of proclinate orbital setae. [Bismarck Archipelago] . . ***P. dubia*** (Malloch) (p. 88)

– Mesopleuron not shining, mostly covered by large densely white pollinose spot. ♂ always with two pairs of proclinate orbital setae [not known from Bismarck Archipelago] . . . . . ***P. auriceps*** Macquart (p. 85)

DESCRIPTIONS OF THE SPECIES

Platytropesa auriceps Macquart, 1851

(Text-figs. 16, 28, 30, 39, 42)

Platytropesa ruriceps [sic] Macquart, 1851, *Mém. Soc. Sci. Lille*, Année 1850 : 197. *Diptères Exot. Suppl.* **4** : 224. Holotype ♂ (not ♀ as cited by Macquart), TRITON BAY (NEW GUINEA). In the Muséum National d'Histoire Naturelle, Paris. [Erroneous spelling of *auriceps* by typographical error.]

Musca opulenta Walker, 1859, *J. Linn. Soc. Lond.* (*Zool.*) **3** : 104. Holotype ♀, ARU ISLANDS. In the British Museum (Natural History), London. **syn. n.**

Silbomyia decrescens Walker, 1864, *J. Linn. Soc. Lond.* (*Zool.*) 7 : 215. Holotype ♂, MYSOL (= MISOÖL). In the British Museum (Natural History), London. **syn. n.**

Platytropesa auriceps Macquart, Townsend, 1931, *Ann. Mag. nat. Hist.*, **10** (8) : 376. [Justified emendation of *ruriceps* Macquart.]

[*Stilbomyia costalis* (Walker) ; Malloch, 1930, *Proc. Linn. Soc. N.S.W.*, **55** : 102, [not of Walker] (misidentification)].

DIAGNOSIS. Mesopleuron with large white pollinose spot ; lower calypter dark brown only on posterior quarter or less ; inner eye-margins in facial view slightly angulate near level of lunula ; ♂ with two pairs of proclinate orbital setae.

♂. *Head* : Interfrontal area dark brown or dark reddish brown ; vertex and ocellar plate dark metallic greenish or bluish, yellow pollinose on either side of posterior part of ocellar plate ; parafrontals, parafacials, genae and postbuccae densely pale yellow to deep golden yellow pollinose over yellow ground colour ; antennal foveae and epistome yellow with thin whitish pollinosity ; facial carina yellow with moderately thick shining pale yellow pollinosity on flattened anterior surface ; postorbits thickly pale yellow to deep golden pollinose ; occiput with dark greenish or bluish ground colour thickly covered with yellow pollinosity, metallic coloration only slightly exposed near cerebrale. Parafrontal hair long and fine, all pale to dark brown ; hair of entire occiput, postbuccae and genae yellowish white to golden yellow. Inner margins of eyes in facial view slightly but distinctly angulate (fig. 16) near level of lunula ; vertex slightly less than a quarter of total head width, eye-vertex-eye ratio about 5 : 3 : 5. Ocellar and cruciate frontal setae all strongly developed ; parafrontals with two pairs of strong proclinate orbital setae. Facial carina very long and heavy, its anterior surface broad and flattened but tapering strongly in upper third towards lunula, sides of the carina very strongly pinched-in towards one another so that antennal foveae are extremely deep, the carina about twice as long as distance from lunula to anterior ocellus and 5·3–6·8 times as long as epistome; in profile the carina gently convex and abruptly set off from the epistome, latter short and slightly prominent. Gena about three-tenths (0·29–0·31) of eye-height. Parafacial set off at very sharp angle from inner eye margin, about equal in width to third antennal segment ; in facial view parafacial appearing very narrow, only about as wide as antenna in facial view. Facial ridges in profile nearly straight, fine setulae reaching slightly over half way up each ridge. Antennae inserted far above mid-eye level, in profile very largely hidden within very deep foveae ; antennal colour blackish brown or very dark reddish brown, third segment extremely elongate and 7·7–8·9 times as long as second segment; seta on second segment short, fine and weak ; arista thickened on basal two-thirds, densely plumose and about three-quarters as long as third antennal segment. Palpi yellowish brown. *Thorax* : usually brilliant emerald green, occasionally with slight coppery tinge ; sometimes violaceous blue with violet scutellum. Hypopleural and posterior pteropleural regions largely reddish brown with metallic greenish or violaceous areas. Dorsum entirely shining metallic, without trace of white pollinose areas. Mesopleuron with a very large conspicuous densely white pollinose spot, appearance of spot shifting only slightly with direction of light ; sternopleuron with thin inconspicuous traces of white pollen visible in some lights, without definite spot. *Wings* : conspicuously dark brown infuscate anteriorly and broadly towards the base, infuscation fading posteriorly but all of the wing with at least a very faint trace of darkening (wing not abruptly divided into a dark costal band and clear posterior region as in *Stilbomyella*). Lower calypter dark brown only on posterior quarter or fifth, otherwise white. *Legs* : black, femora with brilliant metallic green or violaceous reflections. Mid tibia with two strong *ad* setae. *Abdomen* : unicolorous with thorax, varying from brilliant metallic green to violet ; sometimes with slight copper tinge. Margins of tergites dorsally appearing slightly darkened to naked eye, ventrally the tergite margins very narrowly but obviously blackish violet. No trace of white pollen spots anywhere on abdomen, but seen from behind the dorsum of T3 shows exceedingly thin trace of pollinose covering and also trace of a black median vitta ; median excavation of T1+2 usually blackish. T1+2 without median marginal setae ; T3 with a pair of very long strong median marginal setae ; tergites without discal setae. Hair of T3 and T4 of short even length, slightly thickened and erect or semi-erect ; hair of T5 finer and erect. Venter with very long dense hair situated mainly on sternites, but hair of ventral ends of intermediate tergites also rather fine and long ; hair of sternites 3 and 4 very long and reaching back under sternite 5 ; hair of sternite 5 extremely long and dense, ends of longest hairs curling downwards (Text-fig. 28) in lateral view and also inwards towards hairs of opposite lobe of the sternite (Text-fig. 30). Ends of longest hairs of sternites very fine and crinkly. ♂ hypopygium as in Text-figs. 39 and 42 ; mesolobes distinctly curved in profile and evenly rounded at extreme tips, slightly variable in length (longer and narrower in specimens from Palm Islands, Queensland, than in specimens seen from elsewhere) ; paralobes parallel-sided in profile and usually rather long, evenly curved apically. *Measurements* : body length 10·7 mm. (range 8·6–13·3 mm.), wing length 8·4 mm. (range 6·7–10·1 mm.) [7 specimens].

♀. Mostly like ♂, but head in the sexes conspicuously sexually dimorphic, face and antennae not greatly elongate as in ♂. Facial carina not strongly flattened on anterior surface and not strongly pinched-in laterally, antennal foveae less deep than in ♂ ; carina 3·0–3·4 times as long as epistome. Antennae with third segment 4·4–4·9 times as long as second segment, arista equal in length to third segment. Fine hairs on facial ridges reaching only about half way at most up each ridge. Parafacial much broader than in ♂, about 2·5 times as wide as third antennal segment. Interfrontal area wider than a parafrontal at level of lower proclinate orbital seta. Gena slightly wider than in ♂, about one-third of eye-height. Vertex broader, about three-elevenths of total head width, eye-vertex-eye ratio about 4 : 3 : 4. *Measurements* : body length 11·0 mm. (range 8·7–13·1 mm.), wing length 8·7 mm. (range 6·8–10·2 mm.) [8 specimens].

Material examined. *Platytropesa auriceps* Macquart, holotype ♂, New Guinea: Triton Bay (no other data). *Musca opulenta* Walker, holotype ♀, Aru Islands : (*A. R. Wallace*). *Silbomyia decrescens* Walker, holotype ♂, Misoöl : (*A. R. Wallace*).

Molucca Islands : 1 ♂, 1 ♀, Morotai, 25–26.viii.1945 (*D. G. Hull*) (U.S. Nat. Mus.) ; 1 ♀, Morotai, 25–26.viii.1945 (*D. G. Hull*) (B.M. Nat. Hist.). Misoöl Island : 1 ♀, Mysol (= Misoöl) (*A. R. Wallsce*) (B.M. Nat. Hist.) ; 1 ♂, Mysoe (= Misoöl) (*ex coll. Bigot*) (B.M. Nat. Hist.). Waigeo Island : 1 ♂, Waigiou (= Waigeo) (*ex coll. Bigot*) (B.M. Nat. Hist.). Indonesian New Guinea : 1 ♀, Humboldt Bay, Hollandia, sea level, ii.1936 (*L. E. Cheesman*) (B.M. Nat. Hist.); 1 ♂, Fak-Fak (*A. E. Pratt*) (B.M. Nat. Hist.) ; 2 ♀♀, Bernhard Camp, 50 m., 3.x. & 2.xi.1938 (*Neth. Ind. – American N. Guin. Expedit. J. Olthof*) (Rijksmus. Leiden) ; 1 ♀, 1 ♂, Bivak (= Biak) Island, 10.xi.1909 & 23.i.1910 (*Lorentz*) (Rijksmus. Leiden). New Guinea (locality unknown) : 1 ♀ (*ex coll. Bigot*) (B.M. Nat. Hist.). Queensland : 1 ♂, 1 ♀, Kuranda (*F. P. Dodd*) (U.S. Nat. Mus.) ; 1 ♂, Kuranda (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♂, 2 ♀♀, Palm Islands (*Bancroft*) (Div. Ent. Mus. Canberra) ; 1 ♂, Palm Islands, ii.1931 (*Mackerras*) (Div. Ent. Mus. Canberra).

In addition to the foregoing : 1 ♂, without locality data, probably A. R. Wallace specimen (B.M. Nat. Hist.).

Distribution : From northern Moluccas (Morotai) to northern Queensland through western New Guinea including Waigeo, Misoöl and Aru Islands. All specimens seen from New Guinea mainland are from Indonesian New Guinea but *P. auriceps* must almost certainly occur in Papua and probably in North-East New Guinea. The specimens seen from Biak Island have the antennae slightly longer than usual, and males seen from the Palm Islands off the Queensland coast have the mesolobes of the genitalia distinctly more elongate than in males from elsewhere (including Queensland mainland), but specimens from both these localities must be regarded as conspecific with the type of *auriceps* on present evidence.

The specimens recorded above from Palm Islands are those recorded by Paramonov (1957) under the name *Stilbomyia opulenta* (Walker).

Platytropesa dubia (Malloch, 1935) **comb. n.**

Stilbomyella dubia Malloch, 1935, *Proc. Linn. Soc. N.S.W.* **60** : 76. Holotype ♂, NEW BRITAIN. In the School of Public Health and Tropical Medicine, Sydney.

Liostiria ralumensis Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 437. Lectotype ♂, NEW BRITAIN. In the Zoologisches Museum der Humboldt-Universität, Berlin. **syn. n.** [Correct original spelling of specific name based on locality Ralum cited in generic key.]

Liostiria ralumsensis [sic] Enderlein, 1936, *Veröff. dtsch. Kolon Mus. Bremen* **1** : 440. [Erroneous original spelling of specific name by lapsus calami in species description.]

Lectotype Designation : Enderlein described *Liostiria ralumensis* from three ♂ specimens without designating a holotype. Two of the syntypes have been seen, one of which has been labelled by Enderlein as " type " and the other as " cotype ". The specimen labelled as type is here designated as lectotype and has been labelled accordingly ; the second syntype has been labelled as paralectotype. The whereabouts of the third syntype is not known to me.

Diagnosis. Mesopleuron bare and shining, without large white pollinose spot ; ♂ without or with only one pair of proclinate orbital setae. Otherwise like *P. auriceps*.

Discussion. It is not certain that *P. dubia* (Malloch) is specifically distinct from *P. auriceps* Macquart, but with a very limited amount of material as yet available of *Platytropesa* it appears best to recognise it as a separate species for the time being. It is identical with *P. auriceps* in most respects, including the ♂ genitalia and characteristic appearance of the dense hair on the venter of the ♂ abdomen, but the small amount of material known differs consistently from *auriceps* in having a shining mesopleuron without the large bold white spot and the ♂ is without any proclinate orbital setae or with only a single pair (always two pairs of proclinate orbitals in *auriceps*). Specimens with the bare shining mesopleuron assignable to *dubia* are known only from the Bismarck Archipelago, whence *Platytropesa* with a mesopleural spot and two pairs of ♂ proclinate orbital setae is unknown ; thus *auriceps* and *dubia* appear on present evidence to be allopatric.

Liostiria ralumensis Enderlein, described the year after *dubia*, shows no significant differences and is here synonymised with *P. dubia* (Malloch). Ralum, the type-locality of *ralumensis*, lies extremely close to Rabaul—the type-locality of *dubia*—and the two type-series are therefore from the almost identical type-locality. The paralobes of the hypopygium are slightly shorter in the type-material of *ralumensis* than in the ♂ paratype of *dubia*, and the lectotype of *ralumensis* has one pair of proclinate orbital setae (absent in the ♂ paralectotype of *ralumensis* and in males of *dubia* type-series), but these minor differences are almost certainly of no systematic significance and the type-material of *ralumensis* therefore conspecific with that of *dubia*.

The type-specimens of *dubia* are green, the paralectotype of *ralumensis* has a green thorax and bluish green abdomen, and the lectotype of *ralumensis* has a dark greenish blue thorax and violet blue abdomen.

Material examined. *Stilbomyella dubia* Malloch, paratype ♂ and paratype ♀, Bismarck Archipelago : New Britain, Rabaul (*F. H. Taylor*) (U.S. Nat. Mus.). *Liostiria ralumensis* Enderlein, lectotype ♂, Bismarck Archipelago : New Britain, Ralum, in forest-valley on plants [" in Waldtal auf Pflanzen "], 27.ix.1896 (*Dahl*), and paralectotype ♂, Bismarck Archipelago : New Britain, Herbertshöhe, forest-ravine [" Waldschlucht vor Herbertshöhe "], 22.xii.1896 (*Dahl*) (Zool. Mus. Humb. Univ.).

One additional ♀ specimen has been seen which lacks the mesopleural spot but is rather large with most of the lower calypter dark brown (as in *P. simulans* sp. n.) ; this specimen is from New Ireland and may be tentatively assigned to *P. dubia*. The specimen is in the Staatliches Museum für Naturkunde, Stuttgart, and bears Engel's (erroneous) determination label as " Stilbomyia costalis Wlk. " : in addition it carries two other labels, one reading " Nusa " and the other " N.M. ". These old handwritten labels must without doubt refer to Nusa in " Neu-Mecklenburg ", the former German name for New Ireland ; Nusa does not appear on modern maps of New Ireland, but is shown on an old German atlas (Andrees' Handatlas, 1913) at the extreme North Cape of New Ireland near Kavieng.

The ♂ holotype of *dubia* and a second ♀ paratype (latter in U.S. Nat. Mus.) have not been seen, but have identical data and are from the same series as the paratype material recorded above.

Distribution : Only certainly known from the northern part of the Gazelle Peninsula of north-eastern New Britain, but probably occurring more widely in New Britain and in New Ireland, and possibly elsewhere in the Bismarck Archipelago. The localities of the type-material of *ralumensis* (Ralum and Herbertshöhe) do not appear on modern maps but are shown on " Andrees' Handatlas, 1913 " on the south coast of Blanche Bay, New Britain, at approximately 152°17′ E., 4°18′ S.

Platytropesa simulans sp. n.

(Text-figs. 15, 29, 38, 41)

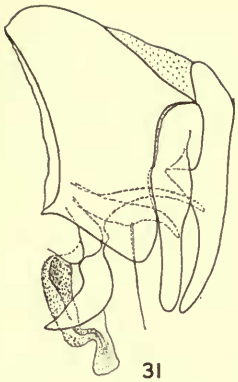
Diagnosis. Mesopleuron with large white pollinose spot ; lower calypter dark brown on posterior third or half ; inner eye margins in facial view slightly and evenly curved ; ♂ without proclinate orbital setae ; mesolobes of ♂ hypopygium nearly straight in profile.

♂. *Head* : Interfrontal area velvety brownish black, sometimes dark reddish brown ; vertex and ocellar plate dark metallic greenish with coppery or bluish tinge, vertex yellowish pollinose on either side of posterior part of ocellar plate ; parafrontals, parafacials, genae and postbuccae densely yellowish white, pale yellow or lemon yellow pollinose over yellow ground colour ; antennal foveae and epistome yellowish or pale reddish yellow with very thin whitish pollinosity ; facial carina pale yellow with yellow or yellowish white pollinosity on anterior surface ; postorbits thickly pale yellow to golden yellow pollinose ; occiput with dark ground colour obscured by thick pale yellow or pale golden pollinosity, some metallic green colour exposed near vertex. Parafrontal hair brownish, long and very fine ; hair of entire

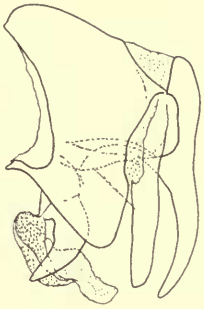
occiput, postbuccae and genae pale to deep yellow. Inner margins of eyes in facial view slightly and evenly curved (Text-fig. 15), not at all angulate near level of lunula ; vertex nearly a quarter of total head width, eye-vertex-eye ratio about 11 : 7 : 11 (one eye viewed from above between 1·5 and 1·7 times as wide as vertex). Ocellar and cruciate frontal setae strong ; proclinate orbital setae absent. Facial carina very large, anterior surface broad and flattened but tapering towards lunula, sides of carina very strongly pinched-in towards one another so that antennal foveae are very large and deep, the carina 1·8 times as long as distance from lunula to anterior ocellus and 4·5–4·8 times as long as epistome ; in profile carina very abruptly and deeply set off from epistome. Gena about three-tenths (0·29–0·31) of eye-height. Parafacial in facial view distinctly broader than antenna in facial view, in full-breadth view also conspicuously broader than third antennal segment. Facial ridges nearly straight or very slightly convex in profile, fine setulae reaching slightly more than half way up each ridge. Antennae in profile inserted well above level of eye middle and about half-hidden within antennal foveae, blackish brown or very dark reddish brown in colour and with third segment 7·0–7·5 times as long as second segment ; seta on second segment fine and weak ; arista thickened only on about basal half and nearly equal in length to third antennal segment. Palpi brownish yellow. *Thorax* : mesonotum brilliant metallic green without pollinosity ; mesopleura and sternopleura green ; hypopleura and hind part of pteropleura reddish brown with traces of metallic reddish violet colour. Mesopleuron with a large densely white pollinose spot, spot conspicuous from most points of view and shifting little with direction of light ; sternopleuron with traces of white pollinosity when viewed from above ; both mesopleura and sternopleura sometimes slightly blue under the pollen. *Wings* : mainly almost clear hyaline or with only faint trace of darkening, but becoming narrowly and gradually dark brown infuscate anteriorly towards the base. Lower calypter dark brown on apical third or two-fifths, the dark brown colour well defined from basal white part of calypter. *Legs* : black with green, coppery green or slightly violaceous metallic reflection on femora. Mid tibia usually with three *ad* setae (as in holotype), occasionally four or only two, number may be different on two mid tibiae of same fly. *Abdomen* : brilliant metallic green without trace of white pollen spots ; sometimes slightly blue violet on the venter anteriorly, posterior margins of tergites appearing slightly darkened ; T3 in some lights with trace of blackish median vitta. T1+2 without median marginal setae ; T3 with a pair of very long and strong median marginal setae ; tergites without discal setae. Hair of T3 and T4 semi-erect to erect on mid dorsum, recumbent elsewhere ; hair of T5 very fine and erect. Venter with very long dense hair on sternites and ventral ends of intermediate tergites; hair very long on sternites 3 and 4 and reaching back under sternite 5 ; hair on sternite 5 very dense but rather straight, in profile not noticeably curved downwards and in ventral view not conspicuously curving inwards towards hair of opposite lobe of sternite (Text-fig. 29) ; longest hairs of sternites very fine and crinkly towards apex. ♂ hypopygium as in Text-figs. 38 and 41 ; mesolobes in profile almost straight, rather truncate apically with a very slightly developed blunt hook ; paralobes usually tapering gradually from base towards apices and extreme tips rather acuminate, paralobe in profile therefore not evenly parallel-sided with rounded apex. *Measurements* : body length 12·4 mm. (range 11·4–13·1 mm.), wing length 10·2 mm. (range 9·2–10·9 mm.) [5 specimens].

♀. Generally like ♂ except for sexual dimorphism of head ; some specimens rather bluish green, lower calypter dark brown on apical half or even more. Face and antennae much shorter

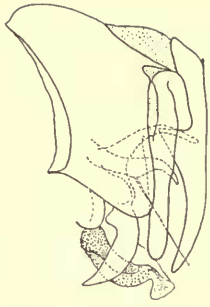
FIGS. 31–42. ♂ hypopygium (lateral view) and mesolobes and paralobes (posterior view) of : (31 and 34) *Silbomyia fuscipennis* (Fabricius). (32 and 35) *Silbomyia albonotata* (Bigot). (33 and 36) *Silbomyia sauteri* Enderlein. (37 and 40) *Stilbomyella nigrocostalis* (Doleschall). (38 and 41) *Platytropesa simulans* sp. n. (39 and 42) *Platytropesa auriceps* Macquart.



31



32



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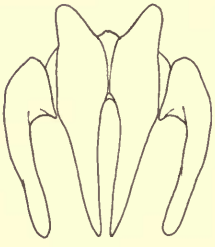

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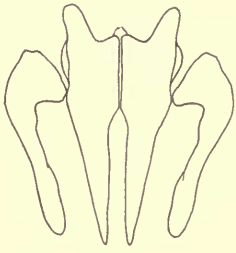

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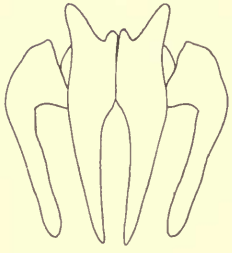

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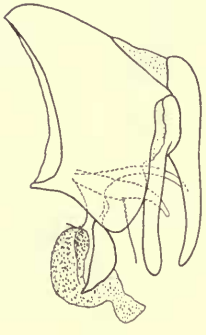

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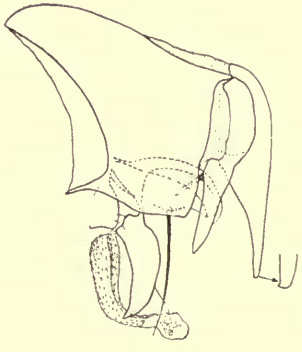

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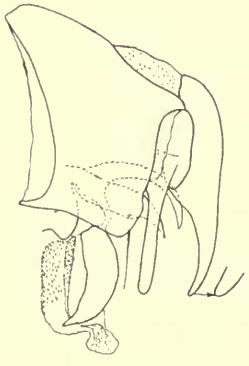

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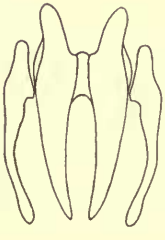

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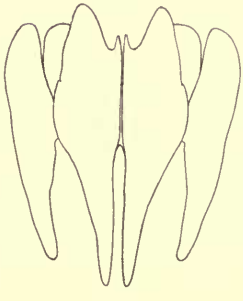
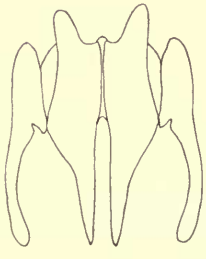


41



42

than in ♂, antennal foveae shallower and antennae in profile hardly at all hidden ; facial carina not flattened on anterior surface or with sides pinched-in, its length 3·4–3·5 times as great as that of epistome ; third antennal segment 3·9–4·8 times as long as second segment, arista conspicuously longer than third segment. Fine setulae on facial ridges reaching only half way or slightly less up each ridge ; parafacial much broader than in ♂, nearly three times as wide as third antennal segment. Interfrontal area about equal in width to parafrontal. Gena and vertex equal in width to ♂. *Measurements* : body length 12·3 mm. (range 9·8–13·7 mm.), wing length 10·1 mm. (range 7·9–11·2 mm.) [6 specimens].

Material examined. Holotype ♂, Indonesian New Guinea : Fak-Fak (*A. E. Pratt*). In British Museum (Natural History), London. Paratypes : 2 ♂♂, 2 ♀♀, data as for holotype (B.M. Nat. Hist.) ; 1 ♂, Indonesian New Guinea : Cyclops Mts., Sabron, 930 ft., v. 1936 (*L. E. Cheesman*) (B.M. Nat. Hist.) ; 1 ♀, Indonesian New Guinea : Njau-Limon, S. of Mt. Bougainville, 300 ft., ii.1936 (*L. E. Cheesman*) (B.M. Nat. Hist.) ; 1 ♀, Japen Island (Indonesian New Guinea) : Camp 2, Mt. Eiori, 2,000 ft., xi.1938 (*L. E. Cheesman*) (B.M. Nat. Hist.) ; 1 ♂, Waigeo Island (Indonesian New Guinea) : Waigiou, 6.i.1910 (*Mevr. de Beaufort*) (Rijksmus. Leiden) ; 1 ♀, Australian New Guinea : Papua, Keria, vii.1962 (*W. W. Brandt*) (Div. Ent. Mus. Canberra) ; 1 ♀, New Guinea (locality not known, probably western New Guinea) (*ex coll. Bigot*) (B.M. Nat. Hist.).

Distribution : New Guinea, including islands of Waigeo and Japen. Apparently mainly western Indonesian New Guinea to judge from limited material so far known, but also Papua ; not yet seen from North-eastern New Guinea. Sympatric on Waigeo and in western New Guinea with *P. auriceps* Macquart.

Affinities. Very closely related to, and superficially extremely like, *Platytropesa auriceps* Macquart but with quite distinct ♂ genitalia (cf. Text-figs. 38 and 41, and Text-figs. 39 and 42). The head of the two species appears almost identical at first glance but is constantly different in facial view in the shape of inner eye margins (cf. Text-figs. 15 and 16), this margin being quite smooth in *P. simulans* sp. n. but always slightly and distinctly angulate at the level of the lunula in *P. auriceps*. The extent of brown infuscation on the lower calypter appears also to be a useful distinguishing character, the extent of dark coloration being much greater in *simulans*. The absence of proclinate orbital setae in the ♂ of *simulans* distinguishes this species from *auriceps* in material so far known, but this character may not hold when more material becomes available. Other minor differences from *auriceps* are shown in the key to species.

STILBOMYELLA Malloch, 1935

Stilbomyella Malloch, 1935, *Proc. Linn. Soc. N.S.W.* **60** : 74. Type-species : *Stilbomyella nitens* Malloch, 1935, by original designation.

Doleschallius Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 441. Type-species : *Rutila nigrocostalis* Doleschall, 1858, by original designation. **syn. n.**

Diagnosis. Ventral surface of costa bare between apices of veins *Sc* and R_1. Fore tibia without *pd* setae. Cross-vein *r-m* very near middle of discal cell. Body form somewhat elongate, abdomen ovate and as long or longer than broad. Mesonotum entirely metallic, without areas of dense white pollinosity. Setulae above vibrissae confined to lower quarter or at most third of each facial ridge. Facial carina not noticeably sexually dimorphic. ♂ frons much narrower than in ♀, eyes of ♂ very strongly approximated. ♂ without proclinate orbital setae and without outer vertical setae (latter present in one exceptional specimen seen). Abdominal sternites 2–5 with very long dense hair in ♂, sternites with spinous setae in ♀.

Discussion. The holotypes of the type-species of *Stilbomyella* Malloch and *Doleschallius* Enderlein are certainly congeneric and possibly conspecific ; Malloch's name has priority and *Doleschallius* falls in synonymy. *Stilbomyella* is to some extent intermediate between *Platytropesa* Macquart and *Amenia* Robineau-Desvoidy, containing metallic green flies superficially similar to *Platytropesa* but lacking *pd* setae on the fore tibia and superficially very different from *Amenia* yet difficult to distinguish from this genus on good structural characters common to both sexes. The main differences between *Stilbomyella* and *Amenia* are shown in the foregoing key to genera, and in my view are of sufficient constancy and magnitude for the two genera to be regarded as distinct. Males of *Stilbomyella* differ conspicuously from the males of all *Amenia* by the presence of very long dense hair on the abdominal sternites, a character shared with the males of most *Platytropesa*.

At present *Stilbomyella* is known only from a limited amount of material : in all I have seen 33 specimens. Five described species belong to the genus, *Rutila* [sic] *nigrocostalis* Doleschall, *Musca costalis* Walker, *Musca gloriosa* Walker, *Musca diffusa* Walker, and *Stilbomyella nitens* Malloch, but it is doubtful whether there is really more than one species—although for the present I am accepting *nitens* (still known only from the ♀ holotype from New Britain) as distinct from *S. nigrocostalis* (Doleschall), with which the Walker names are here synonymised.

The 32 specimens of *Stilbomyella* seen other than the holotype of *nitens* include the holotypes of the other four described species ; the material is variable particularly in the presence or absence of hair on the propleura, the presence or absence of a large densely white pollinose spot on the mesopleuron, the colour of the genal hair, the shape of the facial carina and its width at the ventral end relative to the distance between the vibrissae, the length of the antennae, width of the ♂ frons, density and length of the long hair on sternites of ♂, and the colour of the pollinosity of the head. When only a few specimens are examined there appears to be a segregation of the material into two groups, that without white pollen on the mesopleuron in which the facial carina is usually narrow and subfusiform and the head pollen pale yellowish, and that in which there is a distinct white pollen spot on the mesopleuron combined with a broader elongate triangular facial carina and golden head pollen ; however when all available material is examined these apparently correlated distinctions break down, and fail also to show any definite correlation with geography (although there is a tendency for specimens with bare shining mesopleuron and narrow carina

to be commoner in the west and north of the range, and specimens with white pollinose mesopleuron and broader carina to be commoner in the east and south). This tendency is shown also by the propleural character, all specimens seen from Buru having a bare propleuron and those from Papua and north-eastern New Guinea showing a haired propleuron ; but the propleuron may be bare or haired in specimens from Amboyna and western New Guinea, and the same specimen may have hairs on one side but not the other. The presence or absence of hair on the propleuron is clearly of no value as a specific character in this group. The ♂ genitalia do not appear to differ in specimens showing obvious differences in the external characters.

When more material is available or when *Stilbomyella* can be studied in the field, evidence may emerge to determine whether an east-west cline within a single species exists from eastern New Guinea westwards to the Moluccas, or whether *Stilbomyella* comprises a complex of species all extremely closely allied and difficult or almost impossible to distinguish morphologically. At present there is insufficient evidence for treating any of the observed differences in the available material as specific, and in the absence of evidence to the contrary it appears best to regard the material as conspecific ; *S. nigrocostalis* (Doleschall) is the oldest available name for the single species thus recognised.

The two species other than *S. nitens* placed in *Stilbomyella* by Malloch (1935) at the time of the original description (*opulenta* Walker and *dubia* Malloch) belong in *Platytropesa* Macquart.

Paramonov (1957) has placed *S. nitens* Malloch (type-species of *Stilbomyella* Malloch) in *Silbomyia* Macquart, and has thereby implied that *Stilbomyella* is synonymous with *Silbomyia* ; however *nitens*, and the other species placed in *Silbomyia* by Paramonov, have the ventral surface of the second costal sector bare and lack other characters of true *Silbomyia*. *Stilbomyella* is a valid genus quite distinct from *Silbomyia*.

Distribution (map p. 123). *Stilbomyella* is at present known from the Molucca Islands (Batjan, Buru and Amboyna), the Aru Islands, New Guinea including the islands of Roon and Japen, and New Britain. It probably also occurs in Ceram and Halmahera. I have not seen material of the genus from Australia, but it appears possible that it might occur in northern Queensland.

Key to the Species

1 Size larger, length at least 10·5 mm. Hair of genae and postbuccae usually yellow. Mesopleuron with or without a densely white pollinose spot. [Moluccas, Aru, New Guinea] . . . . . ***S. nigrocostalis*** (Doleschall) (p. 95)

– Size small, length 8·5 mm. Hair of genae and postbuccae brown. Mesopleuron without white pollinose spot. [New Britain.] (Known only from ♀ holotype and possibly conspecific with above species) . . . . ***S. nitens*** Malloch (p. 97)

Descriptions of the Species

Stilbomyella nigrocostalis (Doleschall, 1858) **comb. n.**

(Text-figs. 37, 40)

Rutila nigrocostalis Doleschall, 1858, *Natuurk. Tijdschr. Ned.-Ind.*, **17** : 108. Holotype ♂, AMBOYNA. In the Zoologisches Museum der Humboldt-Universität, Berlin.

Musca gloriosa Walker, 1859, *Proc. Linn. Soc. Lond.* (*Zool.*) **3** : 104. Holotype ♀, ARU ISLANDS. In the British Museum (Natural History), London. **syn. n.**

Musca costalis Walker, 1860, *Proc. Linn. Soc. Lond.* (*Zool.*) **5** : 159. Holotype ♂ [not ♀ as stated by Walker], AMBOYNA. In the British Museum (Natural History), London. **syn. n.**

Musca diffusa Walker, 1861, *Proc. Linn. Soc. Lond.* (*Zool.*) **5** : 290. Holotype ♂, BATCHIAN (= Batjan Island). In the British Museum (Natural History), London. **syn. n.**

[No diagnosis is given as it is not yet certainly established that there is more than this one species in the genus]

♂. *Head* : Interfrontal area brownish black ; parafrontals, parafacials, genae and entire postorbits densely pale to golden yellow pollinose ; facial carina pale yellowish with pale yellow or golden pollinosity ; antennal foveae, facialia and sometimes epistome blackish brown and strongly contrasting in colour with yellow parafacials and genae, epistome yellowish or pale brownish in some specimens. Upper occiput dark greenish black metallic ; cerebrale mainly blackish but uppermost part with an area of yellowish or golden pollinosity extending on to vertex ; vertex blackish brown around ocelli. Parafrontals with a few fine black hairs, upper occipital hair black ; hair of postbuccae usually pale yellow (as in *diffusa* holotype) or golden yellow (as in *gloriosa* holotype) but occasionally dark brown to blackish (as in *nigrocostalis* and *costalis* holotypes), in some specimens mostly pale but with an admixture of a few dark hairs ; hair of postbuccae variable in colour, sometimes mainly or almost entirely pale yellowish but sometimes almost all dark brownish. Eyes very strongly approximated, interfrontal area therefore very reduced with its upper part almost obliterated and parafrontals of each side usually meeting or nearly meeting in mid-line for some distance in front of anterior ocellus ; frons always narrow but exact width a little variable even in specimens from same locality, at narrowest point 0·07–0·10 of head width, exceptionally narrow (0·04 of head width) in one of specimens seen from Buru. Ocellar setae long and very fine, sometimes scarcely differentiated from long hairs on ocellar triangle. Frontal setae mostly very strong and crossed, rows extending nearly to level of anterior ocellus but last few pairs much weaker than others. Facial carina short and usually distinctly widening ventrally, at upper end very abruptly angled from lunula and at lower usually very suddenly set off from epistome, equal in length to or slightly shorter than distance from lunula to anterior ocellus, 2·0–2·9 times as long as epistome; epistome very prominent. Gena 0·26–0·29 of eye-height. Parafacial about three or three and a half times as wide as third antennal segment. Antennae entirely blackish brown, third segment 3·3–3·7 times as long as second segment ; seta on second segment fine and short ; arista conspicuously longer than third antennal segment, with very long fine plumosity. Palpi blackish brown. *Thorax* : brilliant metallic green, often with coppery golden tinge and sometimes slightly bluish green, violet blue in holotype of *diffusa* ; in emerald or cupreous green specimens the hypopleura and pteropleura sometimes partly violet. Very thin inconspicuous covering of whitish pollinosity visible in some lights on whole dorsum of mesonotum and scutellum. Mesopleuron sometimes with large densely white pollinose conspicuous spot (as in holotype of *diffusa*), in other specimens (including holotypes of *nigrocostalis* and *costalis*) mesopleuron appearing bare and shining or showing only very thinnest traces of pollen. Sternopleuron largely covered with white pollinosity visible mainly from above. Propleuron varying from completely bare (as in holotype of *costalis*) to densely haired, sometimes (as in holotypes of *nigrocostalis* and *diffusa*) bare anteriorly but haired posteriorly in some specimens with a very

few hairs only ; same specimen sometimes with propleuron totally bare on one side but with one or two hairs on other side. *Wings* : whole fore margin of wing blackish brown infuscate and posterior part clear hyaline, infuscation covering basal cells and extending back to vein *M* based on *r–m* and to vein R_{4+5} apicad of *r–m* ; usually in addition slight brown staining along part of vein *M* between *r–m* and *m–cu* ; wings of *diffusa* holotype all hyaline, but probably teneral specimen. Costal margin apicad of vein *Sc* very slightly bowed forwards. Bend of vein *M* widely obtuse and near wing margin, distance from bend to margin 0·8–1·1 times that between *m–cu* and bend ; on *M* distance from *r–m* to *m–cu* 2·1–3·1 times as great as that between *m–cu* and bend. Lower calypter all dark brown except white base hidden by upper calypter in wings-folded position, upper calypter mainly opaque white but with variable brownish tinge on inner (wings-folded position) third. *Legs* : black, femora with green to violet metallic reflections ; metallic colouring confined to basal half or two-thirds of middle and hind femora. Mid tibia with one or two, more rarely three, *ad* setae, number sometimes different on two mid tibiae of same specimen (two on one side, three on other in *diffusa* holotype) ; a single strong isolated *ad* seta on each mid tibia of *nigrocostalis* holotype, one strong and one weak seta on each side in *costalis* holotype. *Abdomen* : metallic green with slight coppery or sometimes bluish tinge (violet-blue in *diffusa* holotype). Without white spots, but from behind showing dorsally an extremely thin white pruinosity over most of surface ; T3 with slight trace of a narrow blackish median vitta, not always evident. T1+2 without median marginal setae ; T3 with one pair of very strong erect median marginal setae. Tergites without discal setae, with very short fine recumbent hair. Sternites very broad and exposed ; bearing extremely long dense hair, especially long and curved and backwardly directed on second and third sternites, hair on lateral lobes of fifth sternite generally similar to that of *Platytropesa simulans* (Text-fig. 29), very long and curving slightly inwards rather than backwards. ♂ hypopygium as in Text-figs. 37 and 40. *Measurements* : body length 13·0 mm. (range 11·4–14·4 mm.), wing length 12·0 mm. (range 10·6–13·1 mm.) [9 specimens].

♀. Very like ♂ except for normal secondary sexual differences of strong outer vertical, prevertical and two pairs of very strong proclinate, orbital setae, and sternites with strong spinous setae instead of long hair ; frons broader than in ♂, vertex measured from above almost exactly one-fifth of head width. Interfrontal area varying from very slightly narrower than, to slightly broader than, one parafrontal at level of lower proclinate orbital seta. Gena slightly wider than in ♂, 0·29–0·32 of eye-height. *Measurements* : body length 12·8 mm. (range 8·7–14.9 mm.), wing length 11·7 mm. (range 8·8–13·3 mm.) [6 specimens].

Material examined. *Rutila nigrocostalis* Doleschall, holotype ♂, Amboyna (no other data). *Musca gloriosa* Walker, holotype ♀, Aru Islands : (*A. R. Wallace*). *Musca costalis* Walker, presumed holotype ♂, presumed locality Amboyna : (*A. R. Wallace*). *Musca diffusa* Walker, holotype ♂, Batchian (= Batjan Island) : (*A. R. Wallace*).

Molucca Islands : 1 ♂, 1 ♀, Batchian (= Batjan Island) (*ex coll. Bigot*) (B.M. Nat. Hist.) ; 1 ♂, Buru (*A. R. Wallace*) (B.M. Nat. Hist.) ; 1 ♂, Buru, Station 1, 1921 (*L. J. Toxopeus*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Buru, Station 1, 1921 (*L. J. Toxopeus*) (Rijksmus. Leiden & Zool. Mus. Amsterdam) ; 2 ♂♂, Buru, Station 7, 1921 (*L. J. Toxopeus*) (Rijksmus. Leiden & Zool. Mus. Amsterdam) ; 1 ♂, Buru, Station 13, 29.viii.1921 (*L. J. Toxopeus*) (B.M. Nat. Hist.) ; 1 ♂, Buru, Station 13, 2.ix.1921 (*L. J. Toxopeus*) (U.S. Nat. Mus.) ; 1 ♂, Buru, Station 13, 24.x.1921 (*L. J. Toxopeus*) (Rijksmus. Leiden) ; Aru Islands : 1 ♀, Aru Islands, 1916 (W. W. F. [roggatt]) (Div. Ent. Mus. Canberra). Indonesian New Guinea : 1 ♂, 1 ♀, Roon Island, Geelvink Bay (Staatl. Mus. Stuttgart) ; 1 ♂, Fak-Fak, Onin

Peninsula (*A. E. Pratt*) (B.M. Nat. Hist.) ; 2 ♂♂, Humboldt Bay District, Bewani Mts., ix.1937 (*W. Stueber*) (B.M. Nat. Hist.) ; 1 ♀, Japen Island, Seroei, Camp 1 Mt. Baduri, Aiam Range, 1,000 ft., viii–ix.1938 (*L. E. Cheesman*) (B.M. Nat. Hist.) ; 1 ♂, Japen Island, Camp 2 Mt. Eiori, 2,000 ft., xi.1938 (*L. E. Cheesman*) (B.M. Nat. Hist.) ; 1 ♂, New Guinea (*Macke*) (Rijksmus. Leiden) ; 3 ♂♂, Bernhard Camp, 50 m., 20.ix.–10.x.1938 (*J. Olthof*) (Rijksmus. Leiden) ; 1 ♀, Hollandia, vii.1938 (*L. J. Toxopeus*) (Rijksmus. Leiden). AUSTRALIAN NEW GUINEA : 1 ♂, Papua, Kokoda, 1,200 ft., iv.1933 (*L. E. Cheesman*) (B.M. Nat. Hist.) ; 2 ♀♀, Western Highlands, Uinba, Minj River Valley, 6,200 ft., 11 and 17.viii.1963 (*R. Pullen*) (Div. Ent. Mus. Canberra).

The specimen here accepted as the holotype of *Musca costalis* Walker bears a label reading " costalis " in Walker's writing but no locality or collector's name, and agrees well with the original description except that it is ♂ and not ♀ as Walker (1860b) recorded. There is no other specimen in the British Museum (Natural History) or in the Oxford University Museum which could be the type of *costalis*, and since it is evident from the label in Walker's writing that he saw the specimen named *costalis* by him it is considered justified to hold this specimen as the type ; that it is not the same sex as mentioned by Walker in the original description is not considered important, as it is known from studies of Walker's types that he frequently misidentified the sex or recorded it erroneously. The specimen here recognised as holotype of *costalis* is presumed to be from Amboyna and to have been collected by A. R. Wallace, as this is the information given with the original description.

Distribution : From the Molucca Islands (Batjan, Amboyna, and Buru) eastwards through Indonesian New Guinea to Papua, and also in the Aru Islands. *Stilbomyella nitens* Malloch is very probably not specifically distinctfrom *nigrocostalis*, and if this proves true the known range of *nigrocostalis* will extend further east to include New Britain. When a large amount of material becomes available for study it may prove possible to recognise a number of distinct geographically isolated subspecies within New Guinea and neighbouring islands. *S. nigrocostalis* may possibly occur in the Cape York peninsula of Queensland as Aru Islands species tend to occur there, but this is not yet proved.

Stilbomyella nitens Malloch, 1935

Stilbomyella nitens Malloch, 1935, *Proc. Linn. Soc. N.S.W.*, **60** : 75. Holotype ♀, NEW BRITAIN. In the School of Public Health and Tropical Medicine, Sydney.

[No diagnosis is given as it is not certain that *S. nitens* is specifically distinct from *S. nigrocostalis* (Doleschall)]

DISCUSSION. *S. nitens* is known only from the ♀ holotype which differs from *S. nigrocostalis* only in minor details of size and hair colouring ; at present it is impossible to be certain whether *nitens* is specifically distinct from *nigrocostalis*,

but it appears best to consider it so until more material becomes available. Future study may show that *S. nigrocostalis* ought to be treated as a compound of several good geographically distinct subspecies, and it may then be appropriate to consider *nitens* as a subspecies of *nigrocostalis* occurring in New Britain.

S. nitens is almost identical with *S. nigrocostalis* and has been adequately described by Malloch (1935), and a full description is here unnecessary ; the few following notes on the type are however appropriate. Holotype much smaller than is usual in *nigrocostalis*, length 8·5 mm. ; all hair of genae and postbuccae dark brown, black hair of lower occiput extending round entire mouth opening, head therefore entirely without pale (yellow or brownish yellow) hair ; fine hair above vibrissae extending only one third of way up each facial ridge (not to about middle as stated by Malloch in original description) ; mesopleura shining, without densely white pollinose spot, only with extremely thin traces of a whitish covering in some lights ; general colour more strongly coppery green than Malloch's description " emerald green " suggests. Holotype specimen in imperfect condition, badly greased and with some chaetotaxy missing, head gummed to thorax.

Material examined. Holotype ♀, New Britain : Keravat (*F. H. Taylor*).

Distribution : Only holotype known.

PARAPLATYTROPESA gen. n.

(Text-figs. 13, 24)

Genus of Ameniini with following combination of characters : ventral surface of costa bare between apices of veins *Sc* and R_1. Both sexes with gular region of head strongly produced backwards (Text-fig. 24). Facial carina and epistome forming one continuous median keel with vibrissae of ♂ inserted level with or even slightly below epistomal margin (Text-fig. 13), vibrissae directed slightly upwards. Fore tibia with one submedian *pv* seta, without *pd* setae. Mid femur with only one strong isolated submedian *a* seta. Hind coxa bare on postero-dorsal surface. Facial ridges with fine setulae extending more than half way (♂) or about half way (♀) up their length. Facial carina only slightly sexually dimorphic. Frons broad in both sexes, ♂ eyes not at all approximated, ♂ with proclinate orbital, prevertical and outer vertical setae. Inner vertical setae not crossing, parallel or at most slightly convergent. Abdomen without white pollinose areas on T5. Sternites 2 and 3 of ♂ abdomen with a few very long hairs, sternites of ♀ with spinous setae.

Type-species : *Stilbomyia rieki* Paramonov, 1957.

Discussion. *Paraplatytropesa* gen. n. is erected for the reception of the single species *rieki* Paramonov, originally described in *Silbomyia* Macquart but lacking the true characters of this genus ; in *rieki* the ventral surface of the costa is bare between the apices of veins *Sc* and R_1, there are no strong erect preapical spinous setae on the scutellum, the hind coxa is bare on the postero-dorsal surface, and there is only one *pv* seta on the fore tibia, so the species cannot be regarded as congeneric with *S. fuscipennis*, type-species of *Silbomyia*.

The affinities of *Paraplatytropesa* gen. n. are most closely with *Platytropesa* and *Stilbomyella* which it resembles in the metallic green colour without white pollinose areas on the abdomen, but it differs from these—and other Ameniine genera—in the remarkable development of the gular region of the head. The parallel non-cruciate

inner vertical setae also distinguish the new genus from both *Platytropesa* and *Stilbomyella*, but it resembles the former in having a broad ♂ frons with fully developed outer vertical, prevertical and proclinate orbital setae and resembles the latter in lacking *pd* setae on the fore tibia. The general facies of the ♂ head with very elongate antennae lying in very deep foveae and with setulae up much of the length of the rather straight facial ridges is another character much resembling *Platytropesa*, but the bare hind coxa is a noteworthy distinction from this genus (the latter character does not fully distinguish *Paraplatytropesa* from *Stilbomyella* since the hind coxa is occasionally bare in *Stilbomyella*). A remarkable feature of *Paraplatytropesa* is the presence of only one isolated seta near the middle of the anterior face of the mid femur ; in other Ameniinae there appear always to be two or more setae in this position. The lower calyptrae also vary slightly from other Ameniines in that (in the ♂) the outer posterior margin is regularly and evenly curved, whereas in other Ameniines the outer posterior margin of the lower calypter is very slightly angulate so that the calypter is subtriangular in general shape.

Distribution : Queensland only.

Description of the Species

Paraplatytropesa rieki (Paramonov, 1957) **comb. n.**

Stilbomyia rieki Paramonov, 1957, *Ann. Mag. nat. Hist.* **12** (10) : 54. Holotype ♂, AUSTRALIA. In the Division of Entomology Museum, C.S.I.R.O., Canberra.

Diagnosis as for genus, *Paraplatytropesa* monotypic.

♂. *Head* : Interfrontal area pale red brown to very dark brown ; ocellar plate and mid part of vertex metallic dark green with coppery or blue tinge ; parafrontals and parafacials with blackish ground colour and dense silvery white pollinosity, extreme upper ends of parafrontals nearly bare and rather shining with greenish reflections ; genae with yellow ground colour and golden yellow pollinosity ; postbuccae and gular region dark metallic blackish green with hardly any trace of pollinosity ; antennal foveae black with thin whitish pollinosity ; facial carina and epistome yellow with rather shining and conspicuous creamy white pollinosity ; postorbits thickly silvery white pollinose ; occiput very dark greenish, rather shining with very inconspicuous traces of whitish pollen cover. Hair of parafrontals, genae, postbuccae and most of occiput and gular region black ; some hair of lower occiput and upper part of gular region paler brownish. Vertex almost exactly equal in width to one eye, eye-vertex-eye ratio 1 : 1 : 1. Ocellar setae very strong, cruciate frontal setae all strongly developed ; two pairs of strong proclinate orbital setae. Facial carina very long and not distinctly set off from epistome, the two together forming a single uniform keel about 2·7 times as long as distance from lunula to anterior ocellus, sides of carina nearly parallel. Gena about 0·23 of eye-height. Facial ridges in profile very slightly convex, fine setulae reaching nearly two-thirds of way up each ridge. Antennae inserted very high up (not far below upper margin of eye) and very elongate, mainly hidden in profile in the deep foveae. Antennae black, third segment about 7·25 times as long as second segment ; seta on second segment fine and short ; arista about three-fifths as long as third antennal segment. Palpi yellowish. *Thorax* : bright green with coppery or bluish tinge on mesonotum ; pteropleural and hypopleural regions with bluish or violet metallic reflections, mesopleura sometimes bluish under white pollen spots. Mesonotum with dense white pollinosity on notopleura and in areas of supra-alar setae, prescutum with a covering of

white pollen visible in some lights. Mesopleuron and sternopleuron with large white pollinose area, pollen appearing as conspicuous white spots in some lights but disappearing from other points of view. *Wings* : entirely clear hyaline. Calyptrae opaque white. *Legs* : black, femora with green or violet metallic reflections. Mid tibia with one strong isolated *ad* seta at about three-fifths from base. *Abdomen* : mainly brilliant green, slightly violaceous antero-ventrally ; posterior segments burnished reddish copper in holotype specimen. Abdomen entirely shining, no trace of white pollinose spots. T1+2 without median marginal setae in holotype, but with a weak but distinct pair of median marginals in ♂ paratype specimen (probably normally without) ; T3 with a pair of strong median marginal setae ; tergites without discal setae. Hair of all tergites recumbent. Sternites very broad. Sternite 3 with very long backwardly-directed hair which reaches about to level of apex of sternite 5 ; sternite 4 with long fine hair, but much shorter than that on sternite 3 ; lateral lobes of sternite 5 with moderately long fine hair, but this hair sparse and inconspicuous. *Measurements* : body length 6·0, 7·0 mm., wing length 4·9, 5·6 mm. [2 specimens].

♀. Very like ♂ except for detail of head. Facial carina and epistome forming less parallel-sided median keel than in ♂, carina widening below and epistome very distinctly wider than carina. Antennal foveae less developed, antennae shorter, third antennal segment 4·1–4·3 times as long as second segment ; arista equal in length to third antennal segment. Facial ridges with fine setulae extending only half-way up their length. Parafacial and interfrontal area slightly wider than in ♂. Gena about 0·26 of eye-height. Vertex slightly wider than in ♂, eye-vertex-eye ratio about 7 : 8 : 7. Postero-lateral corner of lower calypter more angulate (calypter generally less evenly rounded) than in ♂. *Measurements* : body length 5·9, 6·0 mm., wing length 4·7, 4·9 mm. [2 specimens].

Material examined. Holotype ♂, Queensland : 30 mls. W. of Collinsville, 12.ix.1950 (*E. F. Riek*). Paratypes : Queensland : 1 ♀ (labelled allotype), 30 mls. W. of Collinsville, 17.ix.1950 (*E. F. Riek*) (Div. Ent. Mus. Canberra) ; 1 ♀, 10 mls. S. of Bowen, 28.ix.1950 (*E. F. Riek*) (B.M. Nat. Hist.) ; 1 ♂, Palm Is., 20.xii.1930–6.i.1931 (*I. M. Mackerras*) (Div. Ent. Mus. Canberra) ; 1 ♀, Springsure, ex trap, xi.1930 (*I. M. Mackerras*) (Div. Ent. Mus. Canberra).

Distribution : Known only from the type-material listed above from east-central Queensland. The known range appears to conform closely with the Queensland part of the range of *Platytropesa auriceps*, both species occurring for instance in the Palm Islands.

AMENIA Robineau-Desvoidy, 1830

Amenia Robineau-Desvoidy, 1830, *Mém. prés. Acad. Sci., Paris*, **2** : 443. Type-species : *Musca leonina* Fabricius, 1775, by subsequent designation of Macquart, 1843a : 273, 1843b : 116.

Ptylostylum Macquart, 1851, *Mém. Soc. Sci. Lille* **1850** : 195, and *Diptères Exot. Suppl.* **4** : 222. Type-species : *Ptylostylum albomaculatum* Macquart, 1851 [= *Musca leonina* Fabricius, 1775], by monotypy.

Neoamenia Malloch, 1930, *Proc. Linn. Soc. N.S.W.* **55** : 103. Type-species : *Neoamenia longicornis* Malloch, 1930, by original designation. **syn. n.**

Chaetamenia Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 442. Type-species : *Dexia chrysame* Walker, 1849, by original designation. **syn. n.**

[*Grapholostylum* Macquart, 1851, of Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 441, not of Macquart (misidentification)]

Diagnosis. Ventral surface of costa bare between apices of veins *Sc* and R_1. Fore tibia with one *pv* seta and without distinct *pd* setae. Cross-vein *r–m* distinctly

before middle of discal cell. Body form short and broad ; abdomen broader than long with normal well formed sutures dorsally between tergites. Mesonotum with three pairs of large marginal white spots. Setulae above vibrissae confined to lower quarter of each facial ridge. Facial carina not noticeably sexually dimorphic. ♂ frons always narrower than ♀ frons, eyes of ♂ usually strongly approximated. ♂ without proclinate orbital and prevertical setae, almost always without distinct outer vertical setae. Abdominal sternites of both sexes with strong setae, ♂ always without long dense hair.

Discussion. *Amenia* contains a small number of unusually beautiful flies which form a characteristic element in the calyptrate fauna of Australia. Eleven described species and one described subspecies are assignable to the genus, but only five species and two subspecies are accepted as valid in the present treatment. One species described in *Amenia* (*nigromaculata* Malloch) belongs in the closely related genus *Formosiomima* Enderlein. The study of the genus has been much bedevilled by misidentifications and erroneous synonymies established in the literature, and the following detailed discussion, based upon examination of all the types, is given to clear up a very confused situation.

The main cause of confusion has been the application of different names to the two commonest species of *Amenia*, one of which is the type-species. These two species are easily distinguished : one has a pair of submedian white lines anteriorly on the mesonotum, typically has a dark bronzy green thorax and dark steel-blue abdomen, and has the eyes of the male strongly approximated ; the other species is without submedian white lines on the dorsum of the thorax, is typically bright golden green, and has the eyes of the male well separated. The name *Amenia imperialis* Robineau-Desvoidy correctly applies to the latter species, and *Amenia leonina* (Fabricius) to the former. Robineau-Desvoidy (1830) included both these species in *Amenia* at the time of its original description, and gave a very good brief description of *A. imperialis* and a statement of the characters by which *leonina* could be distinguished from *imperialis*. *A. imperialis* he described in part as follows : " corselet d'un beau vert-doré métallique, avec trois points argentés de chaque coté du dos ; abdomen d'un beau vert-doré métallique ", thus clearly indicating a golden-green colour and making no mention of submedian white lines on the thorax ; *Amenia leonina*, he remarked, " diffère de l' *A. imperialis* par ses teintes azurées . . . par la présence de deux lignes argentées vers le sommet de l'écusson ". Robineau-Desvoidy was certainly distinguishing between the two commonest species.

Fabricius (1775, 1794, 1805) cited " Mus. Banks " as the depository of his *Musca leonina* Fabricius, and the holotype specimen is still in the Sir Joseph Banks collection (the specimen in the Fabricius collection is not the holotype as erroneously stated by Townsend, 1931, 1937) ; I have examined the holotype and this has confirmed that the thorax is dark brassy green and the abdomen dark blue, and that there are two conspicuous white submedian lines on the mesonotum in addition to the lateral spots, all characters mentioned by Fabricius in the original description and emphasised by Wiedemann (1830) in his more detailed re-description.

Both Wiedemann (1830) and Robineau-Desvoidy (1830) correctly understood *leonina* of Fabricius and rightly applied the name to the species possessing white submedian lines on the thorax, but despite this Macquart (1843a and b) shortly afterwards gives an account of *Amenia* and *A. leonina* which does not conform fully to the true characters of *leonina* Fabricius. In discussing the characters of *Amenia*, Macquart states " Yeux assez séparés ♂. " and in his plate, said to be a figure from *leonina*, shows the mesonotum without evident submedian white lines ; in true *leonina* the ♂ eyes are approximated and the white lines are present and part of Macquart's description therefore appears to relate not to *leonina* but to *imperialis*. Macquart (*op. cit.*) cited *Musca leonina* of Fabricius and of Wiedemann as type of the genus *Amenia*, the earliest type-fixation for the genus, but Enderlein (1936) cited *A. imperialis* R.–D. as type-species (presumably, although no reasons are given, on the assumption that *leonina* of Macquart is not *leonina* of Fabricius but *imperialis* R.–D. through misidentification). However Macquart repeats Wiedemann's (1830) brief Latin description of *leonina* Fabricius and clearly intended that the true *Musca leonina* Fabricius should be type of *Amenia*. Townsend (1931, p. 374 ; 1937, p. 136) has cited *Musca leonina* Fabricius as type-species of *Amenia* Robineau-Desvoidy by designation of Macquart, and this is in my view fully justified on nomenclatural grounds ; there is no justification for holding *A. imperialis* R.–D. to be the type-species.

The names *A. leonina* (Fabricius) and *A. imperialis* Robineau-Desvoidy, which hitherto had been rightly applied to two quite distinct species, were synonymised by Walker (1849) without explanation or justification, and this was the main cause of confusion in the usage of these names, for the erroneous synonymy established by Walker was accepted by Schiner (1868), Osten Sacken (1881), and Engel (1925). *A. leonina* of Schiner, Osten-Sacken and Engel is a misidentification of *A. imperialis* Robineau-Desvoidy, to which attention was first drawn by Malloch (1927) ; to the true *A. leonina* (Fabricius) Schiner applied an unpublished manuscript name, *stictica*. The latter name first appeared as a nomen nudum in Brauer and Bergenstamm (1891 : 418) but a full description was later published by Engel (1925) and the name *stictica* must therefore be attributed to this author ; it sinks in synonymy with *A. leonina* (Fabricius) as Malloch (1933 : 75) implied.

Schiner (1868) synonymised *Ptylostylum albomaculatum* Macquart with his misindentified *leonina* Fabricius (i.e. *imperialis* R.–D.), but examination of the syntypes of *Ptylostylum albomaculatum* in the Paris Museum shows that they are conspecific with the type of *leonina* Fabricius, and the name *albomaculatum* falls in synonymy with true *leonina* ; I am however recognising *albomaculatum* as a subspecies of *leonina*.

Hardy (1938) remarked upon the confusion existing in the application of specific names to the species of *Amenia*, but himself added considerably to the confusion by misidentifying *Amenia parva* Schiner through reliance upon the original description only. Hitherto this species had been correctly understood by Engel (1925) and Malloch (1927, 1928, 1929), both of whom had seen Schiner's types. Malloch (1930), finding that *Dexia chrysame* Walker is an *Amenia* identical with *A. parva*

Schiner, correctly placed the latter name in synonymy with *chrysame* ; this synonymy has been confirmed by my own comparison of the types, and Hardy (1938) is wrong in stating that Malloch made a mistake in establishing this synonymy. Hardy (*op. cit.*), through not accepting the statements of earlier workers who had seen the types and as a result of not seeing the types himself, erroneously applied Schiner's name *parva* to *Amenia leonina* (Fabricius). Thus *A. leonina* (Fabricius) has been variously known in the literature as *leonina, stictica* or *parva,* and at the same time the name *leonina* has often been misapplied to *A. imperialis* Robineau-Desvoidy ; in reality the two common species *A. leonina* and *A. imperialis* are quite distinct and were excellently characterised as long ago as 1830 by Robineau-Desvoidy, and it is difficult to see why confusion should ever have arisen.

Grapholostylum dorsomaculatum Macquart of Enderlein (1936) is not true *dorsomaculatum* of Macquart (which does not belong in the Ameniinae) but a misidentification of *Amenia sexpunctata* Malloch, a name overlooked by Enderlein.

Malloch (1930) described the genus *Neoamenia* for a species in which the facial carina is slightly sulcate but otherwise resembling *Amenia* ; Paramonov (1957) has pointed out that the groove in the facial carina is variable and sometimes absent, and that *Neoamenia* cannot be accepted as a good genus distinct from *Amenia.* I agree fully with Paramonov and regard the type-species of *Neoamenia* and *Amenia* as congeneric ; Paramonov (1957) implied the synonymy but did not definitely establish it, and *Neoamenia* is here sunk in definite synonymy with *Amenia,* The genus *Chaetamenia* Enderlein, erected for *chrysame* Walker, shows no significant differences from *Amenia,* and is here sunk in synonymy. *Ptylostylum* Macquart is synonymous with *Amenia* Robineau-Desvoidy through conspecificity of the type-species.

Distribution : The genus *Amenia* is confined to Australia, where it occurs in all states except Tasmania. In Queensland it occurs in the small islands near the coast (Prince of Wales Island in the Torres Straits, Magnetic Island and the Palm Islands) and in the Northern Territory is known from Groote Eylandt in the Gulf of Carpentaria. The genus is best represented in Queensland and New South Wales, and appears to be uncommon in Victoria and South Australia to judge from the small amount of material yet available from these states.

Macquart (1851) described *Ptylostylum albomaculatum* (= *Amenia leonina* (Fabricius)) from Tasmania, but there is no doubt that this type-locality is erroneous and that the type-material (consisting of six syntypes labelled ' Tasmania ' and ' M. Verreaux ' in the Muséum National d'Histoire Naturelle, Paris) of *P. albomaculatum* must have been collected on the Australian mainland and probably at or near Sydney. It is well established from Hardy's (1929) investigations (Hardy, *loc. cit.* p. 63) that " . . . although Macquart published the descriptions of about one hundred and forty species of Diptera in his fourth supplement [to *Diptères Exotiques*] as being from Tasmania, the majority, if not all, were from Sydney ". *P. albomaculatum* is one of the species collected by the Verreaux brothers and described in the fourth supplement, and this, combined with the absence of *Amenia* from Tasmania, makes it certain that the published type-locality is wrong.

Amenia (as well as all other Ameniini) is absent from New Zealand, but there are erroneous records in the literature of its occurrence here. These records originate with Schiner (1868), who recorded *A. leonina* from New Zealand, a record repeated by Hutton (1873, 1881) in his catalogues of New Zealand Diptera ; the latter author also, without evidence, recorded *A. parva* Schiner from New Zealand in these two earlier catalogues but in his later catalogue (Hutton, 1900, p. 95) deleted both names. Brauer & Bergenstamm (1891, p. 418) recorded *A. stictica* from New Zealand in error.

Key to the Species

1 Scutellum with three pairs of marginal setae 2

– Scutellum with four to six pairs of marginal setae 3

2 Postorbits pale yellow or orange-yellow. Hair of genae and postbuccae golden yellow. ♂ frons extremely narrow with upper part of interfrontal area almost obliterated and parafrontals more or less meeting in mid line, frontal setae of upper half of frons very reduced and hair-like. General colour dark blue-green to bluish violet. Larger species, length 10–14 mm. . ***A. leonina*** (Fabricius) (p. 112)

– Postorbits silvery white. Hair of genae and postbuccae brownish black. ♂ interfrontal area narrow but distinct to the ocelli, frontal setae of upper half of frons well developed. General colour emerald or cupreous green. Smaller species, length 6–11·7 mm. . . . . ***A. chrysame*** (Walker) (p. 120)

3 Upper occiput thickly yellow pollinose over yellow or yellowish orange ground colour. Hair of entire occiput and postbuccae golden yellow. Bend of vein *M* near wing margin, distance from bend to margin not more than 1·3 times as great as that between *m–cu* and bend. Abdominal T4 without lateral white spots. Larger species, length usually 11–16 mm. 4

– Upper occiput non-pollinose, black and semi-shining. Hair of occiput and postbuccae dark brown or black. Bend of vein *M* unusually remote from wing margin, distance from bend to margin at least 2·4 times as great as that between *m–cu* and bend (Text-fig. 19). Abdominal T4 with a pair of small white pollinose lateral spots. Small species, length about 9–10 mm. . . ***A. longicornis*** (Malloch) (p. 116)

4 General colour bright green, sometimes coppery green or slightly bluish green. Scutellum with four pairs of marginal setae (rarely a supernumerary fifth seta present on one side). Abdominal tergites 3 and 4 without submedian spots. Bend of vein *M* obtuse and at least as remote from wing margin as from *m–cu*. Eyes of ♂ widely separated, ♂ frons at least one-sixth of head width. Apical half of costal margin of ♂ wing conspicuously bowed forwards (Text-fig. 21)
A. imperialis Robineau-Desvoidy (p. 107)

– General colour dark purplish black. Scutellum with five or six pairs of marginal setae (occasionally even with a smaller supernumerary seventh seta on one side). Abdominal tergites 3 and 4 each with a pair of dorsal submedian silvery spots with shifting appearance. Bend of vein *M* rectangular and much closer to wing margin than to *m–cu*. Eyes of ♂ very strongly approximated so that frons at narrowest is only slightly wider than anterior ocellus and only about one-twentieth of total head width. Costal margin of ♂ wing not bowed forwards on apical half
A. sexpunctata Malloch (p. 105)

Descriptions of the Species

Amenia sexpunctata Malloch, 1933

Amenia sexpunctata Malloch, 1933, *Proc. Linn. Soc. N.S.W.*, **58** : 76. Holotype ♂. AUSTRALIA. In the Deutsches Entomologisches Institut, Berlin.
[*Amenia stictica* Engel, 1925, *Zool. Jb.*, **50** : 353 (part), misidentified paralectotypes].
[*Grapholostylum dorsomaculatum* Macquart of Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 441, not of Macquart (misidentification)].

Diagnosis. Scutellum with five or six pairs of marginal setae ; large purplish black species with six shifting silvery submedian spots on mid-dorsum of abdomen.

♂. *Head* : Interfrontal area yellow-orange ; parafrontals, parafacials, face, genae and postbuccae with orange-yellow ground colour and golden yellow or golden orange pollinosity ; postorbits yellow with dense golden pollinosity ; occiput with yellow ground colour and a moderately thick covering of pale or deep yellow pollinosity. Parafrontal hair all pale yellow ; all hair of genae, postbuccae and occiput golden yellow. Eyes approaching one another very closely and frons therefore very reduced with upper parts of parafrontals meeting in mid line and upper part of interfrontal area correspondingly obliterated ; at narrowest point frons width only about one-twentieth (0·044–0·054) of total head width and only slightly wider than anterior ocellus. Ocelli raised on well formed ocellar tubercle which occupies most of the reduced vertex, ocelli visible in profile, ocellar setae very weak and hair-like. Upper ends of postorbits very narrowly tapering but just reaching vertex as a very narrow pollinose strip separating postocular setae from eye. Only lowest one or two pairs of cruciate frontal setae well developed, other pairs progressively reduced so that uppermost pairs are minute and hair-like, the rows of frontal setae stopping altogether well before anterior ocellus. Facial carina short and broad but not strongly flattened on anterior surface, antennal foveae well formed, the carina much shorter than distance from lunula to anterior ocellus and about two or two and a half times as long as epistome. Eye relatively longer than in other species and gena correspondingly narrower, gena slightly more than a quarter (0·27) of eye-height. Parafacial about two and a half times as wide as third antennal segment and much narrower than length of this segment. Antennae pale orange, falling short of mouth-margin by about their own length ; third segment 2·9–3·1 times as long as second segment ; seta on second segment fine and shorter than third segment ; arista slightly longer than third segment. Palpi yellow. *Thorax* : dark blackish purple or violet-black, scutellum sometimes with a more violaceous blue tinge but always very dark ; posterior pleural regions partly dark brownish. Margins of mesonotum with the usual three pairs of conspicuous white pollinose spots, the anterior pair almost confined to notopleural area and not noticeably extending on to humeral calli, the latter thinly and obscurely yellowish brown pollinose. In addition to the three pairs of white spots mesonotum shows distinct pattern on prescutum as follows : a pair of conspicuous lateral white pollinose vittae lying laterad of *prst dc* setae, these vittae broadest anteriorly and narrowing and fading out posteriorly before suture ; broad median area of prescutum between *dc* rows of setae almost entirely grey when seen from behind, except for postero-median triangular area which is purplish black, the median grey area becoming conspicuously white pollinose at each antero-lateral corner and when viewed from behind showing an overlying pair of narrow pale brown submedian lines (each brown line lying medially between the *dc* and *acr* rows of each side.). Scutum when viewed from behind showing a rather even covering of pale golden brown pollinosity, similar pollinosity visible on scutellum in some lights ; this pollinosity not visible to naked eye. Appearance of prescutal pattern shifting according to the angle of view. Each mesopleuron and sternopleuron with a small white pollinose spot. Scutellum with five or six pairs of marginal setae, sometimes irregular with five one side and six the other or rarely a supernumerary seventh seta present on one side (total number of marginal scutellar setae therefore from 10 to 13). *Wings* : basal cells obscurely brownish, wings otherwise clear hyaline. Bend of vein *M* sharp

and rectangular, unusually close to wing margin, distance from bend to margin only 0·5–0·6 of that between *m-cu* and bend ; on vein *M* distance from *r-m* to *m-cu* 3·0–3·4 times as great as that between *m-cu* and bend. Calyptrae dark smoky brown except for opaque white outer quarter (in resting position of wings) of upper calypter. *Legs* : dark brownish black with femora inconspicuously violet metallic. Mid tibia usually with two *ad* setae, occasionally three. *Abdomen* : blackish purple and concolorous with mesonotum. T3, T4 and T5 dorsally each with a pair of silvery pollinose spots, those on T3 and T4 larger and close together in a submedian position, those on T5 smaller and more widely spaced in a sublateral position ; the total of six silvery dorsal spots conspicuous to naked eye but their appearance changing greatly with direction of the light, from some points of view the spots appearing to vanish altogether. T3 and T5 in addition to the dorsal spots each with a pair of small lateral (T3) or ventro-lateral (T5) white pollinose spots which are conspicuous to naked eye and more fixed in appearance than the silvery spots of the dorsum ; the two well separated spots on each side of T5 appear to be the equivalent of the upper and lower ends of the normally continuous large lateral white area found in other species. T3 with a pair of very strong median marginal setae, one or both of these setae usually flanked on outer side by a second much smaller, weaker and less erect marginal seta ; sometimes the supernumerary setae outside the normal pair are strongly developed so that there are four strong median marginal setae altogether. *Measurements* : body length 14·3 mm. (range 12·9–15·2 mm.), wing length 13·2 mm. (range 12·6–13·8 mm.) [10 specimens].

♀. Closely similar to ♂ except for very broad frons and broader parafacials and genae. Interfrontal area dark reddish orange and strongly contrasting with paler golden or golden orange pollinose parafrontals, usually almost parallel-sided but sometimes contracted medially, at level of lower proclinate orbital setae slightly narrower than one parafrontal (the parafrontals relatively broad) ; usually two proclinate orbital setae on each side, sometimes a smaller third proclinate orbital seta developed on one or both sides. Hair of parafrontals mainly dark, upper part of each parafrontal and vertex immediately behind ocelli with some short stiff black setulae. Vertex very broad, viewed from above almost exactly equal in width to, or a little wider than, one eye. Postorbits broad all along their length, not narrowed to the vertex. Gena about two-fifths (0·39–0·43) of eye-height. Parafacial nearly five times as wide as third antennal segment. Dorsal submedian silver spots of T3 and T4 sometimes very small, on T3 occasionally evanescent.

MATERIAL EXAMINED. Holotype ♂, AUSTRALIA : Northern Territory, Palmerston, x.1908. Paratype : 1 ♀, data as for holotype (D. Ent. Inst.).

AUSTRALIA : 2 ♂♂, Northern Territory, Palmerston, x.1908 (Zool. Mus. Humb. Univ. & Staatl. Mus. Stuttgart) ; 1 ♂, Northern Territory, Darwin (*G. F. Hill*) (B.M. Nat. Hist.) ; 1 ♂, Northern Territory, Darwin, 22.ix.1913 (*G. F. H[ill]*) (B.M. Nat. Hist.) ; 1 ♂, Northern Territory, Port Darwin (*F. P. Dodd*) (B.M. Nat. Hist.) ; 11 ♂♂, 5 ♀♀, Northern Territory, Port Darwin, x.1908 & i, iii–iv.1909 (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Northern Territory, Port Darwin, x.1908 & iii–iv.1909 (D. Ent. Inst.).

Specimens of *A. sexpunctata* with the same data as the type-material (viz. " Palmerston, N. Australia, October 1908 ") have been mentioned in the literature by Engel (1925) under the name *A. stictica* Schiner in litt. and by Enderlein (1936) under the name *Grapholostylum dorsomaculatum* Macquart. Enderlein (1936, p. 441) pointed out that Engel's material of *stictica* was mixed, some being *A. leonina* (Fabricius) and some (i.e. specimens from Palmerston) being another species which Enderlein identified wrongly as *Grapholostylum dorsomaculatum* Macquart. All the material mentioned by Engel under the name *stictica* forms part of the type-series

of *stictica* Engel (name attributable to Engel as his is the first valid publication of it) and the misidentified specimens from Palmerston which Engel erroneously associated with rest of his *stictica* material are syntypes ; the lectotype designated for *stictica* in this paper sinks this name into synonymy with *leonina*, but since a lectotype is designated the other syntypes of *stictica* become paralectotypes. Thus the specimens from Palmerston mentioned by Engel, although belonging to *A. sexpunctata*, are paralectotypes of *stictica* ; two of them, a ♂ in Staatl. Mus. Stuttgart and a ♂ in Zool. Mus. Humb. Univ. each labelled " Amenia stictica Schin. Engel det.", have been labelled as paralectotypes. It is probable that the ♀ mentioned by Engel is the same specimen as the ♀ paratype of *A. sexpunctata* in D. Ent. Inst, but this is not certain and the specimen is not definitely a paralectotype of *stictica*. The ♂ specimen in Zool. Mus. Humb. Univ. labelled by Engel also bears a label in Enderlein's writing " Grapholostylum dorsomaculatum (Mcq 50) ♂ Dr. Enderlein det. 1936 " and is certainly one of the specimens from Palmerston mentioned by Enderlein (1936, p. 442). Enderlein's identification is wrong, and he completely overlooked Malloch's (1933) earlier description of *A. sexpunctata* for this Palmerston material.

Male paratypes, not seen, are in the Australian Museum, Sydney and U.S. National Museum (one in each Museum) with the same data as the holotype.

Distribution : Apparently confined to the Northern Territory of Australia, including Groote Eylandt in the Gulf of Carpentaria (Paramonov, 1957). The single ♂ with enlarged eye facets recorded by Paramonov (1957) from Claudie River, northern Queensland, has not been seen but may not be true *sexpunctata*. The locality " Western Australia " in Paramonov's (*op.cit.*) key to *Amenia* species is an inadvertant error.

Amenia imperialis Robineau-Desvoidy, 1830

Amenia imperialis Robineau-Desvoidy, 1830, *Mém. prés. Acad. Sci., Paris*, **2** : 443. Neotype ♂, AUSTRALIA. In the British Museum (Natural History), London.

Amenia dubitalis Malloch, 1927, *Proc. Linn. Soc. N.S.W.*, **52** : 343. Holotype ♂, AUSTRALIA. In the United States National Museum, Washington.

Grapholostylum latifrons Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 442. Lectotype ♂, AUSTRALIA. In the Zoologisches Museum der Humboldt-Universität, Berlin.

Amenia imperialis ab *chaetameniina* Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 443. (Name without nomenclatorial status.)

[*Amenia leonina* (Fabricius) ; Schiner, 1868, *Reise Novara, Zool.* **2**, Dipt. : 316, [not of Fabricius] (misidentification)].

[*Amenia leonina* (Fabricius) ; Engel, 1925, *Zool. Jb.*, **50** : 350, 352, [not of Fabricius] (misidentification)].

Diagnosis. Scutellum with four pairs of marginal setae ; general colour green ; upper occiput densely pollinose ; prescutum without white submedian vittae ; ♂ eyes unusually widely separated ; ♂ wing with apical half of costal margin strongly bowed forwards.

Description. See under subspecies below.

Discussion. *A. imperialis*, like *A. leonina*, appears to be represented by two morphologically distinguishable but partly overlapping populations, one mainly centred in northern Queensland in which the frons of the ♂ is extremely broad, and the other mainly centred in New South Wales in which the ♂ frons is conspicuously narrower ; the frontal character and other characters enable almost all specimens of both sexes to be separated without much difficulty, and since there appears to be associated geographical separation two subspecies of *A. imperialis* are here recognised. Malloch's name *dubitalis* is available for the subspecies with the narrower frons, and a neotype is designated below to affix the name *imperialis* sensu stricto to the typical subspecies with broad frons. The ♂ type-material of *Grapholostylum latifrons* Enderlein possesses a narrower frons, and this name falls in synonymy with *dubitalis* Malloch. In *A. imperialis*, unlike *A. leonina*, no importance can be attached to the median marginal setae on T3 ; these setae differ between the sexes (present in ♂, absent in ♀) and the number present in the ♂ is variable—usually the ♂ shows a single pair, but there are occasionally more or even only one. Among 52 male specimens examined 44 have the normal single pair of median marginal setae on T3 three specimens have four setae (i.e. two pairs close together), three specimens have three setae (i.e. one of the normal pair duplicated on one side), one specimen has five setae (two on one side, three on the other), and the remaining specimen has only a single median marginal seta on one side. Variations in the number of setae occur in the males of both subspecies. Enderlein (1936) evidently did not realise that presence or absence of median marginal setae on T3 in *A. imperialis* is a secondary sexual character, and he described specimens with such setae as *A. imperialis* ab *chaetameniina* Enderlein ; this name is without status in nomenclature.

The two subspecies may be distinguished by the following key.

Key to the Subspecies of *A. imperialis*

1 Both sexes without pollinosity on genae and parafacials, these areas dull like the frons whatever the direction of the light. ♂ frons very broad, at vertex 0·23–0·30 of head width, one eye viewed from above 1·2–1·7 times as wide as vertex. ♀ vertex seen from above 1·15–1·30 times as wide as one eye. ♂ ocellar setae well developed, directed straight outwards towards the eyes. Hair of lower parts of parafrontals almost always pale yellow . ***A. imperialis imperialis*** Robineau-Desvoidy (p. 109)

– Both sexes with slightly shining yellow pollinosity on genae and parafacials, that on latter areas best seen when head viewed from above ; in ♂ pollinosity extends half way up parafacial and then stops abruptly, distinction between slightly shining pollinose lower area and dull non-pollinose upper area obvious in some lights ; in ♀ pollinosity reaching up parafacials to lower ends of parafrontals. ♂ frons conspicuously narrower, at vertex 0·16–0·20 of head width, one eye viewed from above 2·0–2·7 times as wide as vertex. ♀ vertex narrower, almost exactly equal in width to one eye seen from above. ♂ ocellar setae usually weaker and sometimes absent, when present directed partly forwards as well as outwards. Pale hair of lower parts of parafrontals usually with an admixture of darker brownish or black hairs, parafrontal hair sometimes entirely dark . ***A. imperialis dubitalis*** Malloch (p. 111)

Amenia imperialis imperialis Robineau-Desvoidy, 1830

(Text-fig. 21)

Amenia imperialis Robineau-Desvoidy, 1830, *Mém. prés. Acad. Sci., Paris*, **2** : 443.

Neotype Designation : Robineau-Desvoidy (1830), in the original description of *Amenia imperialis*, recorded that this species was in the collection of Count Dejean (" Cette espèce, originaire de la Nouvelle-Hollande, fait partie de la collection du compte Dejean ") ; it was never, so far as is known, represented in Robineau-Desvoidy's own collection, and is not in the remnants of that collection now in the Paris Museum. The Diptera from Dejean's collection are lost, and there is therefore no type-material of *A. imperialis* now known to exist ; it is desirable, since *imperialis* has been confused in the past and since it is here treated as comprising more than one subspecies, to designate a neotype to fix the meaning of the name, and I am here designating a specimen in the British Museum (Natural History) as neotype. It is not known from which part of Australia the original material came, but *imperialis* is commonest in Queensland and the specimen chosen for neotype is therefore from this state ; its characters agree as closely as possible with those mentioned in the original description, particularly the " beau vert-doré " colour. The neotype specimen has been labelled " *Amenia imperialis* Robineau-Desvoidy ♂ neotype designated by R. W. Crosskey, 1964 ".

Diagnosis. Diagnostic characters are those given in foregoing key to subspecies.

♂. *Head* : Interfrontal area deep yellow ; parafrontals, parafacials and genae yellow without evident yellow pollinosity and appearing dull like the frons in any light (as both interfrontal area and parafrontals are dull and non-pollinose the only demarcation between them is provided by the frontal setae) ; facial carina, antennal foveae and epistome yellow with thin slightly shining pale yellow pollinosity ; postorbits and entire occiput densely pale yellow or golden pollinose over a yellow ground colour ; postbuccae yellow with thin yellowish pollinosity which is much less conspicuous than that on occiput and disappears altogether towards the genae. Parafrontals with a very few black hairs near vertex but otherwise with extremely short sparse pale yellow hair, lower parts of parafrontals rarely with one or two dark hairs intermixed with pale ones ; all hair of genae, postbuccae and entire occiput pale or golden yellow, that on genae exceptionally short. Eyes widely separated, frons and vertex broader than in other species, the frons swollen and prominent so that in profile it is well visible above the eyes, the parafrontals steeply set off from inner eye margins ; frons at narrowest point near vertex from 0·23–0·30 of head width (0·25 in neotype specimen), one eye viewed from above 1·2–1·7 times as wide as vertex (1·5 times in neotype). Vertex with small blackish brown spot around ocelli, conspicuous to naked eye ; ocellar setae moderately strong and directed straight outwards towards the eyes. Frontal setae short, fine and weak, uppermost pairs hair-like, the setae not nearly meeting in mid line as the two rows are widely separated by the broad interfrontal area (latter about three times as wide as upper part of a parafrontal). Facial carina short and very broad, flattened on outer surface but sometimes very slightly sulcate, much shorter than distance from lunula to anterior ocellus and about 1·75–2·25 times as long as epistome ; antennal bases widely separated, antennal foveae rather shallow. Gena exceptionally broad, about half (0·48–0·53) of eye-height. Parafacials very broad, five or six times as wide as third antennal segment or about equal in width to the length of third antennal segment. Antennae yellowish orange, falling short of mouth-margin by slightly less than their own length ; third segment 3·5–3·9 times as long as second segment (3·7 times in neotype) ; seta on second segment well developed but much shorter than third segment, arista equal in length to third segment. Palpi

yellow. *Thorax* : mesonotum bright green, often with a coppery golden or coppery reddish tinge (as in neotype), sometimes bluish green ; scutellum usually unicolorous with mesonotum, occasionally a little more bluish. Margins of mesonotum with the usual three pairs of conspicuous white pollinose spots in notopleural, supra-alar and postalar positions, but without submedian white pollinose vittae on prescutum ; prescutum seen from behind with thin traces of evenly distributed whitish pollinosity, sometimes in certain lights showing a pair of very fine longitudinal coppery lines which reach back nearly to transverse suture. Sides of thorax dark greenish, sometimes partly violet on sternopleura and mesopleura, hypopleura and pteropleura reddish violaceous ; mesopleura and sternopleura with large white pollen spots, appearance of those on mesopleura shifting with light. Hair of propleura almost always black, rarely brownish yellow. Scutellum with four pairs of marginal setae. *Wings* : brown at base, otherwise clear hyaline. Costal margin apicad of end of *Sc* conspicuously bowed forwards (Text-fig. 21) and vein R_{2+3} with corresponding strong forward curvature. Bend of vein *M* obtuse, distance from bend to wing margin 1·0–1·3 times as great as that between bend and *m-cu* ; on vein *M* distance from *r-m-* to *m-cu* 3·1–4·2 times as great as that between *m-cu* and bend. Lower calypter all dark brown except for basal part which is hidden when wings are folded back, upper calypter usually all white but sometimes partly tinged pale brown. *Legs* : dark black-brown, slightly dark greenish or violet metallic on femora. Mid tibia almost always with three *ad* setae of which basal one is very small, rarely with only two or with four *ad* setae. *Abdomen* : brilliant golden green, sometimes bluish green or cupreous ; venter violet on at least first two tergites and sternites. Each side of T3 ventro-laterally with a large brilliantly white pollinose area, appearance of the white spots changing greatly with angle of the light but most conspicuous in lateral view, thin traces of whitish pollinosity extending round dorsally from the ventro-lateral spots to form a very thin pollinose covering on whole dorsum of tergite which is visible only from behind. T4 non-pollinose, without spots. T5 with a pair of very large brilliant white pollinose areas situated mainly ventrally but extending round each side of tergite well on to dorsum, appearance of the white areas changing very strikingly with the direction of light (cf. *leonina* in which white spots on T5 are fixed in appearance). T3 with median marginal setae, almost always a single pair, but occasionally three, four or even five such setae, very rarely only one of the pair developed ; in single exceptional specimen seen median marginal setae absent from T3. T5 without or with only a very few hairs situated on the pollinose areas. *Measurements* : body length 13·0 mm. (range 9·1–16·2 mm.), wing length 11·6 mm. (range 8·2–14·5 mm.) [35 specimens]. Dimensions of neotype : body length 12·9 mm., wing length 11·9 mm.

♀. Generally very like ♂ but costal margin not noticeably bowed forwards and abdominal T3 without median marginal setae. Frons broader than in ♂ and slightly exceeding one eye in width seen from above, eye-vertex-eye ratio about 9 : 11 : 9 ; one eye from above from 1·15–1·30 times as wide as vertex. Proclinate orbital setae variable in size and number, usually three or four on each side but sometimes five or only two, number often different on the two parafrontals of same specimen. Size range similar to that of ♂.

MATERIAL EXAMINED. Neotype ♂, AUSTRALIA : N. Queensland, Cairns District (*R. C. L. Perkins*). In British Museum (Natural History), London.

AUSTRALIA : 7 ♂♂, 2 ♀♀, Queensland, Stradbroke, 20.ix.1915 (*J. C. Bridwell*) (U.S. Nat. Mus.) ; 1 ♂, Queensland, Gordonvale, xi.1922 (*E. Jarvis*) (U.S. Nat. Mus.) ; 1 ♂, Queensland, Cairns, 1917 (*J. F. Illingworth*) (U.S. Nat. Mus.) ; 1 ♀, Queensland, 1892 (*v. Mueller*) (Staatl. Mus. Stuttgart) ; 1 ♂, Queensland (Staatl. Mus. Stuttgart) ; 1 ♂, Queensland, Cairns (*F. H. Taylor*) (Staatl. Mus. Stuttgart) ; 1 ♀, Queensland, Herberton, 3,200 ft., xii.1910 (*Dodd*) (Staatl. Mus. Stuttgart) ; 1 ♂, 1 ♀, Queensland, Herberton, i.1911 (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♀, Queensland, Herberton (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Prince of Wales Is., Torres Strait, 19.v.1903 (*M. J. Nicoll*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Thursday Is., 14.i.1939

(B.M. Nat. Hist.) ; 1 ♂, Queensland, Cape York (B.M. Nat. Hist.) ; 1 ♀, Queensland, Rockhampton (B.M. Nat. Hist.) ; 1 ♀, Queensland, Stannary Hills, c. 3,000 ft. (*T. L. Bancroft*) (B.M. Nat. Hist.) ; 1 ♂, 2 ♀♀, Queensland, Townsville (*F. P. Dodd*) (B.M. Nat. Hist.) ; 2 ♀♀, Queensland, Townsville, i. & 27.ii.1903 (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, i.1903 (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Queensland, vii.1909 (B.M. Nat. Hist.) ; 1 ♂, 2 ♀♀, Queensland, Kuranda (*Dodd*) (B.M. Nat. Hist.) ; 1 ♂, Queensland (*F. P. Dodd*) (B.M. Nat. Hist.) ; 2 ♂♂, 1 ♀, Queensland, Redlynch, 11.ix.1938 (B.M. Nat. Hist.) ; 1 ♂, Milson Is. (? Queensland), 18.xii.1914 (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Eccleston, 26.ii.1921 (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Como, 10.xi.1923 (*Nicholson*) (B.M. Nat. Hist.) ; 3 ♂♂, New South Wales, Sydney (*Bridwell*) (U.S. Nat. Mus.) ; 1 ♀, New South Wales, Chester Hill, 6.xi.1927 (U.S. Nat. Mus.) ; 1 ♂, New South Wales, Katoomba, Blue Mts., 3,400 ft., 1912 (*Dodd*) (Staatl. Mus. Stuttgart) ; 1 ♀, New South Wales, Sydney, Auburn, 12.v.1927 (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, New South Wales, Toronto, Filmer (*Health Dept.*) (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Cumberland (B.M. Nat. Hist.) ; 4 ♂♂, New South Wales, Gooranbong, 26.ii.1950 (*B. McMillan*) (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Mt. Kuring-Gai, 27.ix.1950 (*B. McMillan*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, labelled Kopp. Biberach. 1917 (Staatl. Mus. Stuttgart) ; 8 ♂♂, Australia (no other data) (Oxford Mus.) ; 1 ♂, Australia (no other data, ex coll. Bigot) (B.M. Nat. Hist.).

Distribution : *A. imperialis imperialis* occurs commonly in Queensland and New South Wales, in the latter state overlapping with *A. imperialis dubitalis* ; in Queensland it occurs on the groups of small islands—Prince of Wales Islands, Thursday Island, Palm Islands, Magnetic Island—as well as on the mainland. Paramonov (1957) records *imperialis* sensu stricto from one locality in Northern Territory of Australia. Paramonov's (*loc. cit.*) records from New South Wales suggest that *imperialis* typical form and *dubitalis* occur so commonly near together that the two forms ought not perhaps to be regarded as subspecies ; however until field work can resolve better the status of the two forms it appears best to regard them for the time being as subspecies.

Amenia imperialis dubitalis Malloch, 1927 **stat. n.**

Amenia dubitalis Malloch, 1927, *Proc. Linn. Soc. N.S.W.*, **52** : 343.
Grapholostylum latifrons Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 442. **syn. n.**

Lectotype Designation : no holotype of *Grapholostylum latifrons* was designated by Enderlein and the species was based on four specimens (in Zool. Mus. Humb. Univ.) ; three of these syntypes (all ♂) have been seen, and one has been labelled and is here designated as lectotype. Syntypes seen other than the lectotype have been labelled as paralectotypes ; one of these has been erroneously labelled by Enderlein as ♀.

Diagnosis. Diagnostic characters as given in foregoing key to subspecies.

Very similar to the typical subspecies, but differs in the following characters : ♂ frons conspicuously narrower, at the vertex only 0·16–0·20 of total head width (0·16 in *dubitalis* holotype, 0·17 in *latifrons* lectotype), viewed from above one eye from 2·0–2·7 times as wide as

vertex (2·7 in *dubitalis* holotype, 2·5 in *latifrons* lectotype) ; ♀ frons also narrower than in typical subspecies, at vertex almost exactly equal in width to one eye when measured from above. Ocellar setae of ♂ often absent, when present usually very weak and directed partly forwards as well as outwards. Hair of parafrontals sometimes all dark brownish or black, if largely pale yellow then almost always with an admixture of dark hairs. Genae and parafacials of both sexes with fine yellow slightly shining pollinosity, these areas therefore not completely dull, pollinosity on parafacials best seen when head is viewed largely from above, pollinosity on parafacial in ♂ extending about half way up and then stopping abruptly so that upper half is quite dull and non-pollinose, in ♀ all of parafacials pollinose up to lower ends of parafrontals ; on ♂ parafacial possible to see definite line at which pollinosity stops if head is viewed from a certain angle, in other lights pollinosity of lower half not very noticeable. Size range much as in typical subspecies, body length 12·8 mm. (range 8·7–15·3 mm.), wing length 11·2 mm. (range 8·0–13·0 mm.) [15 specimens of both sexes].

Material examined. *Grapholostylum latifrons* Enderlein, lectotype ♂, Australia (*Damel*), ♂ paralectotype with same data as lectotype, and ♂ paralectotype labelled *Kraatz* and presumed locality Australia (all in Zool. Mus. Humb. Univ.).

Australia : 3 ♂♂, New South Wales, Sydney (*ex coll. Bigot*) (B.M. Nat. Hist.) ; 2 ♂♂, New South Wales, Sydney (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Shoalhaven River, Tallong, 1.xii.1951 (*B. McMillan*) (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Grose R., 1.iv.1950 (*B. McMillan*) (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Toronto, Filmer (*Health Dept.*) (B.M. Nat. Hist.) ; 1 ♀, New South Wales, Jenolan Caves, 2,000 ft. (*J. C. Wiburd*) (U.S. Nat. Mus.) ; 1 ♂, Queensland, Brisbane, 2.xii.1913 (*H. Hacker*) (B.M. Nat. Hist.) ; 2 ♂♂, Queensland, Mackay (*G. Turner*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Tambourine (?), Davidson, 10.xii.1916 (*W. W. Froggatt*) (B.M. Nat. Hist.) ; 1 ♀, Queensland, Burnett River District (*T. L. Bancroft*) (B.M. Nat. Hist.).

The holotype of *A. dubitalis* has not been seen, but has been examined for me by Mr. Curtis Sabrosky. The holotype data are : New South Wales, Sydney, National Park, 1.xi.1902 (*W. W. Froggatt*). The ♀ specimen listed above from Jenolan Caves is exceptionally small and possesses a pair of median marginal setae on T3 (such setae are absent in all other females of *imperialis* seen), but it appears justified for the present to assign it to *dubitalis*.

Distribution : Known only from New South Wales and the southern half of Queensland, being replaced in northern Queensland by the typical subspecies ; however, there is considerable overlap of the ranges of the subspecies in New South Wales. *A. imperialis dubitalis* is evidently much more common in New South Wales than in southern Queensland ; of thirty specimens of *dubitalis* recorded by Paramonov (1957) only five are from Queensland.

Amenia leonina (Fabricius, 1775)

Musca leonina Fabricius, 1775, *Systema Ent.* : 776. Holotype ♂, AUSTRALIA (' NEW HOLLAND '). In the Sir Joseph Banks collection, British Museum (Natural History), London.

Ptylostylum albomaculatum Macquart, 1851, *Mém. Soc. Sci. Lille*, **1850** : 195. *Diptères Exot. Suppl.* **4** : 222. Lectotype ♂, AUSTRALIA (' TASMANIA ' in error). In Muséum National d'Histoire Naturelle, Paris.

Amenia stictica Brauer and Bergenstamm, 1891, *Denkschr. Akad. Wiss. Wien*, **58** : 418 (nomen nudum : publication without description of manuscript name of Schiner).
Amenia stictica Engel, 1925, *Zool. Jb.*, **50** : 353. Lectotype ♂, AUSTRALIA. In the Naturhistorisches Museum, Vienna. (First valid publication of Schiner's manuscript name.)
[*Amenia parva* Schiner ; Hardy, 1938, *Proc. roy. Soc. Qd* **49** : 58, [not of Schiner] (misidentification)].

DIAGNOSIS. Scutellum with three pairs of marginal setae ; genal hair and postorbits yellow ; prescutum with a pair of broad white pollinose submedian lines.

DESCRIPTION. See under the subspecies below.

DISCUSSION. Paramonov (1957) recognised the subspecies *A. leonina leonina* (Fabricius) and *A. leonina enderleini* Paramonov. It is impossible to be certain of the significance of the differences between the two forms but from examination of a good series there appears to be sufficient constancy of structural difference and a sufficient degree of allopatry to justify the recognition of two subspecies, at least for the present ; I am following Paramonov in treating *leonina* as two subspecies, but am applying Macquart's old name *albomaculatum* to the subspecies in which median marginal setae on T3 are present, since these setae exist on some specimens of Macquart's original type-series of *Ptylostylum albomaculatum* (a lectotype is here designated to fix the usage of the name *albomaculatum*). The lectotype here designated for *A. stictica* Engel is without median marginal setae on T3 and this name therefore goes into synonymy with *A. leonina* sensu stricto.

A summary of the differences between the two subspecies is given in the following key.

KEY TO THE SUBSPECIES OF *A. leonina*

1 Both sexes with a pair of median marginal setae on T3. ♂ head very broad, 1·15–1·24 times as wide as thorax at the humeral calli. Upper parts of postorbits of ♂ obliterated so that eyes abut directly against upper occiput. ♂ frons extremely reduced, at narrowest point only between 0·023 and 0·036 of head-width. Head of ♀ golden orange pollinose . . ***A. leonina albomaculata*** (Macquart) (p. 115)
– Both sexes without median marginal setae on T3. ♂ head not conspicuously broad, 1·05–1·14 times as wide as thorax at the humeral calli. Upper parts of postorbits very narrowly tapering and evident as a yellow pollinose band more or less reaching vertical seta in ♂, eyes therefore not abutting directly against upper occiput. ♂ frons broader, eyes less strongly approximated, at narrowest point frons between 0·035 and 0·055 of head-width. Head of ♀ pale to golden yellow pollinose ***A. leonina leonina*** (Fabricius) (p. 113)

Amenia leonina leonina (Fabricius, 1775)

Musca leonina Fabricius, 1775, *Systema Ent.* : 776.
Amenia stictica Engel, 1925, *Zool. Jb.*, **50** : 353.

DIAGNOSIS. Diagnostic characters as given in above key.

♂. *Head* : Interfrontal area yellow-orange ; parafrontals, parafacials, face, genae, postbuccae and lower occiput with orange-yellow ground colour and golden yellow pollinosity ; postorbits densely golden pollinose ; upper occiput blackish brown, slightly shining in some lights and without evident pollinosity. Parafrontal hair short and black ; hair of genae,

postbuccae and lower occiput golden yellow ; hair of dark uppermost parts of occiput black. Eyes very strongly approximated and frons therefore reduced, upper part of interfrontal area almost eliminated by coming together of parafrontals in mid line ; frons at narrowest point 0·035–0·055 of head width, head only slightly (1·05–1·14 times) wider than thorax at humeral calli. Ocelli slightly raised, ocellar setae weak. Upper end of each postorbit very narrowly tapering but just about reaching inner vertical seta as a distinct yellow pollinose band which clearly separates the upper occiput from the eye. Lowest pairs of cruciate frontal setae well developed, but the setae becoming progressively weaker dorsally and uppermost pairs extremely weak and hair-like, the row of setae stopping altogether well below anterior ocellus. Facial carina short and broad, antennal bases well separated and antennal foveae shallow ; the carina much shorter than distance from lunula to anterior ocellus and only about 1·75 times as long as epistome, latter elongate and poorly differentiated from ventral end of facial carina. Gena very broad, about two-fifths (0·37–0·43) of eye-height. Parafacial about four times as wide as third antennal segment, width therefore about as great as length of this segment. Antennae orange, very small and falling short of mouth-margin by more than their own length ; third segment 2·4–2·7 times as long as second segment ; seta on second segment usually a little shorter than third segment ; arista much longer than third segment. Palpi yellow. *Thorax* : mesonotum dark green with a slight bronze or bluish tinge, occasionally violet-blue ; scutellum dark blue-green, blue or violet, almost always more distinctly blue than the mesontoum ; sides of thorax bluish green or violaceous on mesopleura and sternopleura, otherwise dark brownish. Mesonotum with usual three pairs of large boldly marked white pollinose spots, anteriormost pair covering both humeral calli and notopleura ; prescutum with a submedian pair of broad white pollinose longitudinal bands which extend back to and end abruptly at transverse suture, these white bands lying between *acr* and *dc* rows of setae and their appearance shifting very much with the direction of the light (the white bands disappearing altogether from some points of view and being replaced by a pair of fine longitudinal cupreous lines in positions mid-way between *acr* and *dc* rows of setae) ; prescutum, in addition to broad submedian bands, with a pair of small indefinite white pollinose areas lying on the transverse suture just laterad of the *prst ia* seta (or in this position if this seta, as sometimes happens, is absent), these white areas visible only from behind. Each mesopleuron and sternopleuron with a large rounded and boldly marked white spot, appearance of these spots not shifting with direction of light. Scutellum with three pairs of marginal setae. *Wings* : brown on the basal cells, otherwise clear hyaline. Bend of vein *M* nearly rectangular, distance from bend to wing margin only 1·1–1·4 times as great as that between bend and *m-cu* ; on vein *M* distance from *r-m* to *m-cu* 3·5–4·1 times as great as that between *m-cu* and bend. Calyptrae dark brown except for half of upper calypter opaque white. *Legs* : black with dark greenish to violaceous metallic reflections on femora. Mid tibia almost always with two *ad* setae, rarely a third very small *ad* seta present basad of the usual two. *Abdomen* : dark blue-green, blue or violet dorsally, usually largely violaceous ventrally. T3 with a pair of very small white pollinose spots on extreme sides of tergite, their appearance slightly shifting with direction of light, and usually with a pair of rather indefinite silvery pollinose submedian spots (the latter very inconspicuous to naked eye in most specimens). T4 without pollinose spots. T5 with a pair of very large boldly marked creamy white spots dorso-laterally, these spots extending round each side of the tergite and fixed in appearance, not fading or disappearing when seen from different angles. T3 without median marginal setae. T5 without hair on the areas of the creamy-white spots or medially between the spots. *Measurements* : body length 12·5 mm. (range 10·3–14·0 mm.), wing length 10·8 mm. (range 9·0–12·0 mm.) [20 specimens].

♀. Very like ♂ except for broad frons. Interfrontal area broad and slightly widening dorsally, 1·8–2·25 times as wide as parafrontal at level of lowest proclinate orbital seta ; usually two proclinate orbital setae present on each side, but occasionally with a third or fourth smaller proclinate orbital in addition. Vertex slightly variable in width, usually about two-sevenths of head width, eye-vertex-eye ratio varying from 11 : 10 : 11 to 14 : 10 : 14. Mid tibia almost always with three *ad* setae. Measurements much as in ♂.

MATERIAL EXAMINED. *Musca leonina* Fabricius, holotype ♂, AUSTRALIA (no other data). *Amenia stictica* Engel, lectotype ♂, AUSTRALIA : Queensland, Cape York, 1868 (*Thorey*) and paralectotype ♀, AUSTRALIA : Queensland (Nat. Mus. Vienna).

AUSTRALIA : 6 ♂♂, 3 ♀♀, Queensland, Kuranda (*F. P. Dodd*) (B.M. Nat. Hist) ; 2 ♂♂, Queensland, Kuranda (*F. P. Dodd*) (U.S. Nat. Mus.) ; 6 ♂♂, 2 ♀♀ Queensland, xii.1913–i.1914 (B.M. Nat. Hist.) ; 2 ♂♂, Queensland (Staatl. Mus. Stuttgart) ; 1 ♀, Queensland, Herberton, 3,700 ft., ii.1911 (*Dodd*) (Staatl. Mus. Stuttgart) ; 1 ♀, Queensland, Herberton, i.1911 (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Palm Island (*F. H. Taylor*) (Staatl. Mus. Stuttgart) ; 1 ♂, Queensland, Cardstone, nr. Tully Falls, 9.i.1962 (*E. B. Britton*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Queensland, Townsville (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♀, Queensland, Druidson, 10.ii.1916 (*W. W. Froggatt*) (B.M. Nat. Hist.) ; 1 ♂ labelled, ' Australia ' and Ptylostylum albomaculatum, *ex coll. Bigot* (B.M. Nat. Hist.) ; 8 ♀♀, Northern Territory, Port Darwin, x.1908 and i.1909 (B.M. Nat. Hist.) ; 4 ♀♀, New South Wales, Sydney, Auburn, 12.v.1927 (B.M. Nat. Hist.).

In addition 2 ♂♂ and 1 ♀ without data have been seen in Oxford Mus.

Distribution : *A. leonina leonina* is the more northerly subspecies and occurs predominantly in northern Queensland to the north of Bowen and in the Northern Territory. It is less common in southern Queensland (southwards from Bowen) where it is largely replaced by *A. leonina albomaculata*. Some specimens of the nominate subspecies have been seen from New South Wales and Paramonov (1957) has also recorded the typical form from this state and it is evident that the distribution of the typical subspecies overlaps considerably with that of subspecies *albomaculata*.

Amenia leonina albomaculata (Macquart, 1851)

Ptylostylum albomaculatum Macquart, 1851, *Mém. Soc. Sci. Lille* **1850** : 195. *Diptères Exot. Suppl.* **4** : 222.

Amenia leonina ab *chaetameniina* Enderlein, 1936, *Veröff. dtsch. Kolon Mus. Bremen* **1** : 443. (Name without nomenclatorial status).

Amenia leonina enderleini Paramonov, 1957, *Ann. Mag. nat. Hist.*, **12** (10) : 60. Holotype ♂, NEW SOUTH WALES. In the Division of Entomology Museum, C.S.I.R.O., Canberra. **syn. n.**

LECTOTYPE DESIGNATION : the type-material of *Ptylostylum albomaculatum* Macquart (in Mus. Hist. Nat. Paris) consists of two ♂ and four ♀ syntypes ; of the six syntypes, three (a ♂ and two ♀) have median marginal setae on T3 and other three syntypes do not. The ♂ syntype in which median marginal setae on T3 are present has been labelled and is here designated as lectotype ; the name *albomaculatum* is thus affixed to the form possessing these setae.

DIAGNOSIS. Characters as given in foregoing key to subspecies.

Very similar in most characters to the nominate subspecies but differing as follows : Both sexes with a pair of median marginal setae on abdominal T3. Head of ♂ very broad, 1·15–1·24 times as wide as thorax measured at the humeral calli. Frons of ♂ extremely narrow and at

its narrowest point only 0·023–0·036 of head width. Ocelli (♂) raised on a very distinct ocellar tubercle which is especially prominent because of the reduction of vertex and frons. Upper parts of the postorbits in ♂ obliterated so that the postorbits do not nearly reach the vertex, the upper parts of the eyes abutting directly against the occiput. Head of ♀ with more distinctly orange colour, the pollinosity golden orange and not usually so yellow as in typical subspecies. The pair of small whitish pollinose submedian spots on T3 often more conspicuous than in typical subspecies, sometimes very distinct to naked eye. Size range as in typical subspecies.

Material examined. Australia : 3 ♂♂, New South Wales, Toronto, Filmar (*Health Dept.*) (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Jervis Bay, xii.1926–ii.1927 (*F. A. Rodway*) (B.M. Nat. Hist) ; 1 ♂, 1 ♀, New South Wales, Awaba, 9.ii.1950. (*B. McMillan*) (B.M. Nat. Hist.) ; 1 ♀, National Park, 12.iv.1925 (*Mackerras*) (U.S. Nat. Mus.) ; 1 ♂, Queensland, Mackay (*G. Turner*) (B.M. Nat. Hist.) ; 1 ♀, Queensland, Buderim Mts., 7.iv.1912 (*H. Hacker*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Queensland, Brisbane, 24.ix.1914 (*H. Hacker*) (B.M. Nat. Hist.) ; 1 ♀, Milson Island, 23.ix.1915 (B.M. Nat. Hist.) ; 1 ♀, Rockhampton, 1868 (*Thorey*) (Nat. Mus. Vienna, paralectotype of *A. stictica* Engel) ; 2 ♀♀, Australia (no other data, *ex coll. Bigot*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, without data (Staatl. Mus. Stuttgart).

Distribution : *A. leonina albomaculata* has a more southerly distribution in Australia than the typical subspecies, and occurs principally in New South Wales and southern Queensland ; in the latter area it occurs northwards as far as Brisbane and Bowen and overlaps in distribution with *A. leonina leonina*. Paramonov (1957, p. 60) has recorded a large number of specimens of this subspecies (under the name *A. leonina enderleini*) from New South Wales and has also recorded it from Victoria. Paramonov's type of *enderleini* is from Bateman's Bay, N.S.W. Malloch (1929) recorded a specimen of *A. leonina* from Deep Creek, near Kingscote, Kangaroo Island, South Australia ; I have not seen the specimen on which this record is based, but from the locality it almost certainly belongs to the subspecies *albomaculata*.

Macquart (1851) cited Tasmania as the type-locality of *Ptylostylum albomaculatum*, and the type-specimens are labelled ' Tasmania ' ; *A. leonina* does not occur in Tasmania and, as discussed earlier (see page 103), the type-locality of *albomaculata* is almost certainly New South Wales.

Amenia longicornis (Malloch, 1930)

(Text-fig. 19)

Neoamenia longicornis Malloch, 1930, *Proc. Linn. Soc. N.S.W.*, **55** : 103. Holotype ♂. WESTERN AUSTRALIA. In the Division of Entomology Museum, C.S.I.R.O., Canberra.
Amenia longicornis (Malloch), Paramonov, 1957, *Ann. Mag. nat. Hist.* **12** (10) : 57.

Diagnosis. Scutellum with four pairs of marginal setae ; general colour purple-black ; abdominal T4 with a pair of lateral white spots ; facial carina pinched-in inwardly and antennae in deep foveae ; upper occiput black and shining.

♂. *Head* : Interfrontal area yellow-orange or deep orange ; parafrontals, parafacials and genae orange-yellow with bright golden orange pollinosity ; facial carina, antennal foveae and epistome yellow-orange with pale yellowish pollen, that on carina rather shining ; postorbits

thickly yellow or bright golden pollinose ; postbuccae and lower parts of occiput yellow-orange and semi-shining, almost devoid of pollinosity ; upper two-thirds of occiput (except for orange cerebrale) very dark shining black-brown, non-pollinose. Parafrontal hair black, some of uppermost parafrontal hairs rather strong and proclinate and resembling small irregular proclinate orbital setae ; genal hair yellow, hair of postbuccae pale brown to blackish ; all occipital hair black. Eyes well separated, frons and vertex broader than in other species except *imperialis*; frons narrowest about midway between lunula and ocelli and gradually and slightly widening from this point to vertex, interfrontal area either slightly narrowed near middle or gradually and evenly broadening from lunula to ocelli. Vertex seen from above and measured across posterior ocelli varying from 0·23–0·32 of head width (0·24 in holotype). Vertex with black spot around ocelli easily visible to naked eye ; ocellar setae well developed, directed mainly outwards. A pair of minute but distinct prevertical setulae present in some specimens, counterpart of prevertical setae of female. Vertex with outer vertical setae distinguishable, either very fine and hair-like and only slightly longer than setulae of postocular row or (in South Australian specimens) well developed. Frontal setae not or only just meeting at tips, uppermost pairs not very noticeably weaker than lowest pairs. Facial carina very heavy, strongly postero-laterally compressed so that outer surface is rather flattened and sides very conspicuously pinched-in towards one another ; anterior surface of carina sometimes sulcate (as in holotype) but often rather flat, shape in facial view variable, in some specimens regularly elongate-oval but in others merging through to more lanceolate shape with upper end more gradually contracting than ventral end ; length of carina variable as well as shape, from 1·9–3·3 times as long as epistome (3·3 times as long in holotype) and longer or shorter than distance from lunula to anterior ocellus. Antennal foveae very deep, antennal bases not widely separated. Gena a little over a third of eye-height in most specimens but varying from 0·32–0·42 of eye-height (0·32 in holotype). Parafacial two to three times as wide as third antennal segment. Antennae orange, length variable, third segment from 3·2–5·9 times as long as second segment (5·9 times in holotype) ; seta on second segment rather weak ; arista equal in length to third antennal segment in specimens with very short antennae, much shorter than third segment in specimens with elongate antennae, in latter specimens thickened for slightly more than half its length and more densely plumose. Palpi yellow. *Thorax* : purplish black ; dark purple colouring most evident on scutellum and near white spots. Mesonotum with usual three pairs of bold thickly white pollinose marginal spots, front pair of which cover top of humeral callus and notopleuron ; prescutum with a pair of white pollinose submedian vittae which taper posteriorly and die out well before transverse suture, vittae sometimes small and inconspicuous to naked eye, their appearance shifting with direction of light ; marginal spots with fixed appearance irrespective of viewpoint. Each mesopleuron and sternopleuron with large white spot. Scutellum with four pairs of marginal setae (lateral pair rather weak in holotype specimen). *Wings* : clear hyaline except for usual dark brown infuscation over basal cells. Costal margin not bowed forwards in holotype, but in some specimens conspicuously or slightly bowed forwards apicad of vein *Sc* (bowing forwards of wing most developed in S. Australian specimens). Bend of vein *M* widely obtuse, apical part of vein almost straight from bend to apex. Bend of *M* unusually remote from wing margin (Text-fig. 19), distance from bend to margin 2·3–3·9 times as great as that between *m-cu* and bend ; on vein *M* distance from *r-m* to *m-cu* 3·5–5·2 times as great as that between *m-cu* and bend. Calyptrae dark brown except for extreme base of lower calypter and outer three-quarters (in wings-folded position) of upper calypter which are opaque white. *Legs* : black with metallic violaceous reflections on femora. Mid tibia with three or four *ad* setae and sometimes some smaller additional *ad* setulae. *Abdomen* : dark purple, slightly more violaceous and less black in appearance than mesonotum. T3 with a pair of lateral white pollinose bands extending round sides of tergite from ventro-lateral position and fading out dorso-laterally, appearance of these white areas depending on direction of light, inconspicuous dorsally from some points of view. T4 with a pair of very small but conspicuous white pollinose lateral spots (absent in other *Amenia*), rounded in shape and not extending on to dorsum of tergite. T5 with a pair of very large white bands occupying most of sides of tergite, very broad and extending from near ventral margins of tergite round on to dorsal surface, bands

of each side separated mid dorsally by about one-third of width of tergite ; white bands appearing brilliantly and boldly marked to naked eye, but under microscopic examination shifting in appearance with direction of light, from some points of view appearing silvery or very dark greyish with a narrow metallic blue margin around the pollinose areas. T3 with a pair of strong median marginal setae, occasionally one of the pair duplicated so that there are three median marginals in all. T5 without or with only very few hairs situated on white areas. *Measurements* : body length 10·5 mm. (range 9·4–11·6 mm.), wing length 9·2 mm. (range 7·5–10·3 mm.) [11 specimens]. Dimensions of holotype : body length 9·4 mm., wing length 7·5 mm.

♀. Very like ♂ but differing in broader frons and vertex and normal unbowed costal margin of wing. Interfrontal area 1·5–1·7 times as wide as a parafrontal at level of lowest proclinate orbital seta. Parafrontals with two or three pairs of proclinate orbital setae. Vertex seen from above 0·31–0·35 of head width. Facial carina 2·0–2·4 times as long as epistome. Antennae short in all known specimens, third segment 2·8–3·4 times as long as second segment. *Measurements* : body length 8·8 mm. (range 8·4–9·2 mm.), wing length 7·8 mm. (range 7·5–8·2 mm.) [4 specimens] ; the few females at present available are probably at small end of size range and a longer series would probably show mean size near that of ♂.

Material examined. Holotype ♂, Australia : Western Australia (*Newman*).

Australia : 1 ♂, 1 ♀, Western Australia, 1902 (*Heath*) (B.M. Nat. Hist.) ; 1 ♀, Western Australia, Booanya, ii.1932 (*Miss A. E. Baesjou*) (Div. Ent. Mus. Canberra); 2 ♀♀, Western Australia, Margooinya Rks. 4 mls. WSW of Balladonia H.S., 10.xii. 1953 (*J. H. Calaby*) (Div. Ent. Mus. Canberra) ; 5 ♂♂, Western Australia, 8 mls. E. of Youlgannah R.H., N. of Eyre, 5.viii.1952 (*Calaby & McIntosh*) (Div. Ent. Mus. Canberra and B.M. Nat. Hist.) ; 1 ♂, Western Australia, 100 mls. W. of Eucla, 25.x.1958 (*E. F. Riek*) (Div. Ent. Mus. Canberra) ; 3 ♂♂, South Australia, 25 mls. SW. of Iron Knob, 23.x.1958 (*E. F. Riek*) (Div. Ent. Mus. Canberra and B.M. Nat. Hist.) ; 1 ♂, South Australia, 40 mls. SW. of Iron Knob, 23.x.1958 (*E. F. Riek*) (Div. Ent. Mus. Canberra) ; 1 ♂, South Australia, Wilpena Pound (*H. M. Hale*) (Div. Ent. Mus. Canberra).

Distribution : Only known from the south-eastern part of Western Australia and from South Australia. It is of interest to note that in Western Australia, judging from material so far available, the range of *A. longicornis* (Malloch) does not overlap with that of *Formosiomima nigromaculata* (Malloch) which appears to be confined to the south-western corner of Western Australia ; *Formosiomima* appears to replace *Amenia* in the extreme south-west corner of Australia.

Discussion of Variability. At present *A. longicornis* is known only from a very limited amount of material but it is nonetheless evident that the species (assuming as here, that the material is truly conspecific) varies considerably in its cephalic characters. Male specimens from South Australia have short antennae, a short facial carina which is regularly elongate oval in facial view, a broader vertex, rather strongly developed outer vertical setae and a strongly marked forward bowing of the costal margin of the wing ; most males from Western Australia, on the other hand, have elongate antennae and a long rather lanceolate facial carina, a narrower vertex, very weak or hair-like outer vertical setae and no well marked bowing forward of the costa. At first it appeared likely that *A. longicornis* fell into two distinct, largely geographically isolated, populations definable as subspecies but this was not satisfactorily confirmed when measurements on all available were taken into account;

for instance, a specimen from near Eucla in the extreme east of Western Australia is completely intermediate between specimens from further west in Western Australia and specimens from further east in South Australia. There appears to be no point at which there is any sudden break, and there is a gradual transition in the variable head characters from east to west. *A. longicornis* occurs only so far as is known in a relatively small area of southern Australia across the Nullarbor Plain and the southern part of the state of South Australia, but within this area the species appears to show an east-west cline with a very rapid transition of certain characters : thus from east to west the ♂ vertex gets narrower, the facial carina longer and narrower, the antennae much longer, and the outer vertical setae much weaker ; in addition there is a narrowing of the parafacials and genae, and the loss of the forward bowing of the costal wing margin. Unfortunately the exact locality of the holotype specimen in Western Australia is unknown, but it has the longest antennae and facial carina and the narrowest vertex of any specimen seen and by inference therefore must have been collected at or near the extreme western end of the distribution range. Insufficient female material is yet available to determine whether this sex shows similar evidence of a cline. However for the present it appears best to regard all available male and female material as belonging to a single species, *A. longicornis*, and showing strong evidence of a cline within this species. There is no clear evidence of definite geographical subspeciation. The evidence for a cline will be clear from the following tabulation :

(a) Locality : Wilpena, S.A., approx. longitude 139° E., vertex 0·31 of head width, carina 1·9 times as long as epistome, third antennal segment 3·2 times as long as second.

(b) Locality : near Iron Knob, S.A., approx. longitude 134–135° E., vertex 0·31–0·32 of head width, carina 2·0–2·2 times as long as epistome, third antennal segment 3·4–4·1 times as long as second.

(c) Locality : near Eucla, W.A., approx. longitude 127° E., vertex 0·29 of head width, carina 2·4 times as long as epistome, third antennal segment 3·5 times as long as second.

(d) Locality : near Eyre, W.A., approx. longitude 126° E., vertex 0·25–0·26 of head width, carina 2·7–3·2 times as long as epistome, third antennal segment 4·7–5·3 times as long as second.

(e) Holotype specimen (exact locality unknown) : vertex 0·24 of head width, carina 3·3 times as long as epistome, third antennal segment 5·9 times as long as second.

Foregoing data refers to male specimens and exact localities are given in detail under ' material examined ' above ; abbreviations ' S.A. ' and ' W.A. ' refer to states of South and Western Australia respectively.

Amenia chrysame (Walker, 1849)

Dexia chrysame Walker, 1849, *List Spec. Dipt. Ins. coll. Brit. Mus.*, **4** : 866. Holotype ♀, AUSTRALIA (' NEW HOLLAND '). In the British Museum (Natural History), London.
Amenia chrysame (Walker), Malloch, 1930, *Proc. Linn. Soc. N.S.W.*, **55** : 101. *Chaetamenia chrysame* (Walker), Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 442.
Musca varia Walker, 1852, *Ins. Saundersiana* **1**, Dipt. pt. iv : 342. Holotype ♀, AUSTRALIA. In the British Museum (Natural History), London. **syn. n.**
Amenia parva Schiner, 1868, *Reise Novara, Zool.* **2**, Dipt. : 316. Lectotype ♂, AUSTRALIA. In the Naturhistorisches Museum, Vienna. *Grapholostylum parvum* (Schiner), Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 442.
Chaetamenia chrysame ab *graphostylina* Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 442. (Name without nomenclatorial status.)

Lectotype Designation : type-material of *Amenia parva* Schiner consists of two ♂ syntypes in the Vienna Museum ; one of these has been labelled and is here designated as lectotype, the other has been labelled as paralectotype.

Diagnosis. Scutellum with three pairs of marginal setae ; postorbits silvery white ; genal hair brownish black ; basal quarter or third of discal cell largely devoid of macrotrichia.

♂. *Head* : Interfrontal area yellow-orange ; parafrontals, parafacials, genae, postbuccae and extreme lower parts of occiput yellow with yellow or golden pollinosity ; face yellow or orange-yellow with yellow pollinosity on facial carina but rather bare and shining on epistome and lower ends of antennal foveae ; postorbits densely silvery white pollinose over dark ground colour ; most of occiput very dark brownish black and shining, non-pollinose ; upper part of cerebrale yellow-orange like vertex. All hair of parafrontals, genae and postbuccae brownish black ; occipital hair black. Eyes approximated and frons narrow but interfrontal area distinct throughout its length and at its narrowest point as wide as or usually slightly wider than one parafrontal at corresponding position ; frons narrowest a little in front of anterior ocellus and widening very slightly from this point to vertex, at its narrowest 0·10–0·14 of head width. Vertex usually with dark brown spot around ocelli ; ocellar setae very weak, not strongly differentiated from tuft of long hairs on ocellar triangle. Postorbits very strongly tapering towards vertex and almost obliterated just before vertical setae so that uppermost setulae of postocular row are inserted very close to eye. Frontal setae well developed, each row reaching about to level of anterior ocellus and setae becoming only gradually and slightly weaker dorsally, setae of each side just meeting or crossing only near the tips ; none of frontal setae very weak and hair-like. Facial carina narrower than in other species, slightly elongate and rounded on outer surface (not at all sulcate), sometimes a little pinched-in laterally and slightly fusiform in facial view, equal in length to or a little shorter than distance from lunula to anterior ocellus, 2·5–2·9 times as long as epistome ; epistome very distinctly set off from ventral end of carina and unusually prominent. Gena 0·31–0·38 of eye-height. Parafacial about three times as wide as third antennal segment. Antennae usually brownish on basal segments except for orange dorsal tip of second segment, third segment pale orange ; third segment 3·0–3·5 times as long as second segment ; seta on second segment well developed but much shorter than third segment ; arista about equal in length to third segment. Palpi yellow. *Thorax* : mesonotum bright coppery green, sometimes with coppery reddish or golden tinge, occasionally emerald or slightly bluish green ; scutellum concolorous with mesonotum. Mesonotum with three pairs of white pollinose marginal spots, front pair on notopleura and hind part of humeral calli conspicuous to naked eye but other pairs small and much less conspicuous ; prescutum with a pair of broad white pollinose submedian vittae occupying most of area between *dc* and *acr* rows of setae on each side, vittae only obvious to naked eye near fore margin of prescutum but from behind under microscopical examination seen to extend back thinly to transverse

suture ; submedian white vittae disappearing in some lights as fly is turned, but then a pair of very fine coppery longitudinal lines usually evident underlying the pollen. Sides of thorax largely green anteriorly but reddish brown with violet or dark greenish tinge posteriorly, usually also partly violet around white spot on mesopleuron ; each mesopleuron and sternopleuron with large very boldly marked white pollinose spot, appearance not shifting with light. Scutellum with three pairs of marginal setae. *Wings* : clear hyaline except for dark brown mark over basal cells. Costal margin without definite forward bowing. Basal quarter or third of discal cell with membrane bare, devoid of macrotrichia except sometimes near mid line. Bend of vein *M* slightly obtuse, distance from bend to wing margin 1·1–1·4 times as great as that between *m-cu* and bend ; on vein *M* distance from *r-m* to *m-cu* usually 2·9–3·3 times as great as that between *m-cu* and bend. Upper calypter opaque white, lower calypter dark brown except for white extreme base. *Legs* : dark black-brown, femora only slightly violaceous metallic. Mid tibia usually with only a single strong submedian *ad* seta, sometimes with a much smaller *ad* seta nearer the base ; never with more than two *ad* setae in material seen. *Abdomen* : bright green dorsally and postero-ventrally, mainly violet antero-ventrally, dorsum usually with bright coppery reflections at least posteriorly, dorsum of T4 and T5 sometimes extensively reddish copper. Hind margins of tergites sometimes more distinctly cupreous than rest of surface. Dorsally usually with a narrow but distinct median longitudinal dark line which is widest and blackish on T3 but very narrow and copper-coloured on succeeding tergites ; on last two visible tergites median coppery line sometimes lost in general copper colouring. T3 on each side with a broad band of white pollinosity appearance of which shifts with direction of light, viewed from behind white pollinosity seen to extend thinly on to most of dorsum of the tergite ; from behind white pollinose areas appear clearly separated from one another in mid line by the broad blackish median vitta. T4 non-pollinose. T5 with usual pair of large lateral white pollinose areas which extend round on to dorsum of tergite, appearance of the white spots changing greatly with direction of light. T3 with one or two pairs of very strong erect median marginal setae (specimens with two pairs referred to by Enderlein (1936) as aberration *graphostylina*), occasionally a very strong pair flanked by a much weaker less erect outer pair, some specimens with three strong median marginals. Pollinose areas of T5 with sparse hair like rest of tergite. *Measurements* : body length 9·0 mm. (range 7·5–9·8 mm.), wing length 8·5 mm. (range 7·2–9·5 mm.) [8 specimens].

♀. Mainly like ♂ but differing as follows : frons very broad but strongly contracting towards vertex, viewed from above width of vertex about a quarter (0·25–0·28) of head width ; interfrontal area equal in width to or a little narrower than a parafrontal at level of lower proclinate orbital seta ; frontal setae more strongly crossed ; ocellar setae long and strong ; apparently always with two *ad* setae on mid tibia ; abdomen without dark fine median line and with very indistinct pollinosity dorso-laterally on T3, this tergite only noticeably white on sides and with median blackish vitta at most only partially and weakly developed. In all specimens seen only two pairs of (for *Amenia*) unusually strong proclinate orbital setae. Size range much as for ♂, holotype of *varia* Walker (in poor condition) is smallest specimen seen, body length 6·0 mm., wing length about 5·2 mm.

MATERIAL EXAMINED. *Dexia chrysame* Walker, holotype ♀, AUSTRALIA (no other data). *Musca varia* Walker, holotype ♀, AUSTRALIA (no other data). *Amenia parva* Schiner, lectotype ♂, AUSTRALIA : New South Wales, Sydney (*Novara Exp.*) and paralectotype ♂, data as for lectotype (Nat. Mus. Vienna).

AUSTRALIA : 1 ♀, Victoria, Bright (*H. W. Davey*) (B.M. Nat. Hist.) ; 1 ♀, Victoria, Ararat (*H. W. Davey*) (B.M. Nat. Hist.) ; 1 ♀, New South Wales, Laura (B.M. Nat. Hist.) ; 1 ♀, New South Wales, Sydney, 4.xii.1921 (*Health Dept.*) (B.M. Nat. Hist.) ; 2 ♂♂, New South Wales, Sydney (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Sydney (*Bridwell*) (U.S. Nat. Mus.) ; 1 ♂, Mill, Allyn Range, 18.xii.1922

(*Nicholson*) (U.S. Nat. Mus.) ; 1 ♀, New South Wales, Milson Is. (B.M. Nat. Hist.) ; 1 ♂, New South Wales, Mt. Kuring-Gai, 27.ix.1950 (*B. McMillan*, (B.M. Nat. Hist.) ; 1 ♂, Queensland, Brisbane (*Bridwell*) (U.S. Nat. Mus.) ; 1 ♂, 1 ♀, Queensland, Brisbane, 24.ix.1914 (*H. Hacker*) (U.S. Nat. Mus.) ; 1 ♀, Queensland, Eidsvold (*J. L. Bancroft*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Mackay (*G. Turner*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Kuranda (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Queensland, Herberton, 3,700 ft., xii.1910 (*Dodd*) (Staatl. Mus. Stuttgart).

In addition to the foregoing material I have seen one ♂ (in Zool. Mus. Humb. Univ.) without locality data but with the collector's name ' v. Kraatz ' ; the specimen has been labelled by Enderlein as ' Grapholostylum parvum (Schiner 1868) ' and is the one referred to in Enderlein's (1936, p. 442) paper.

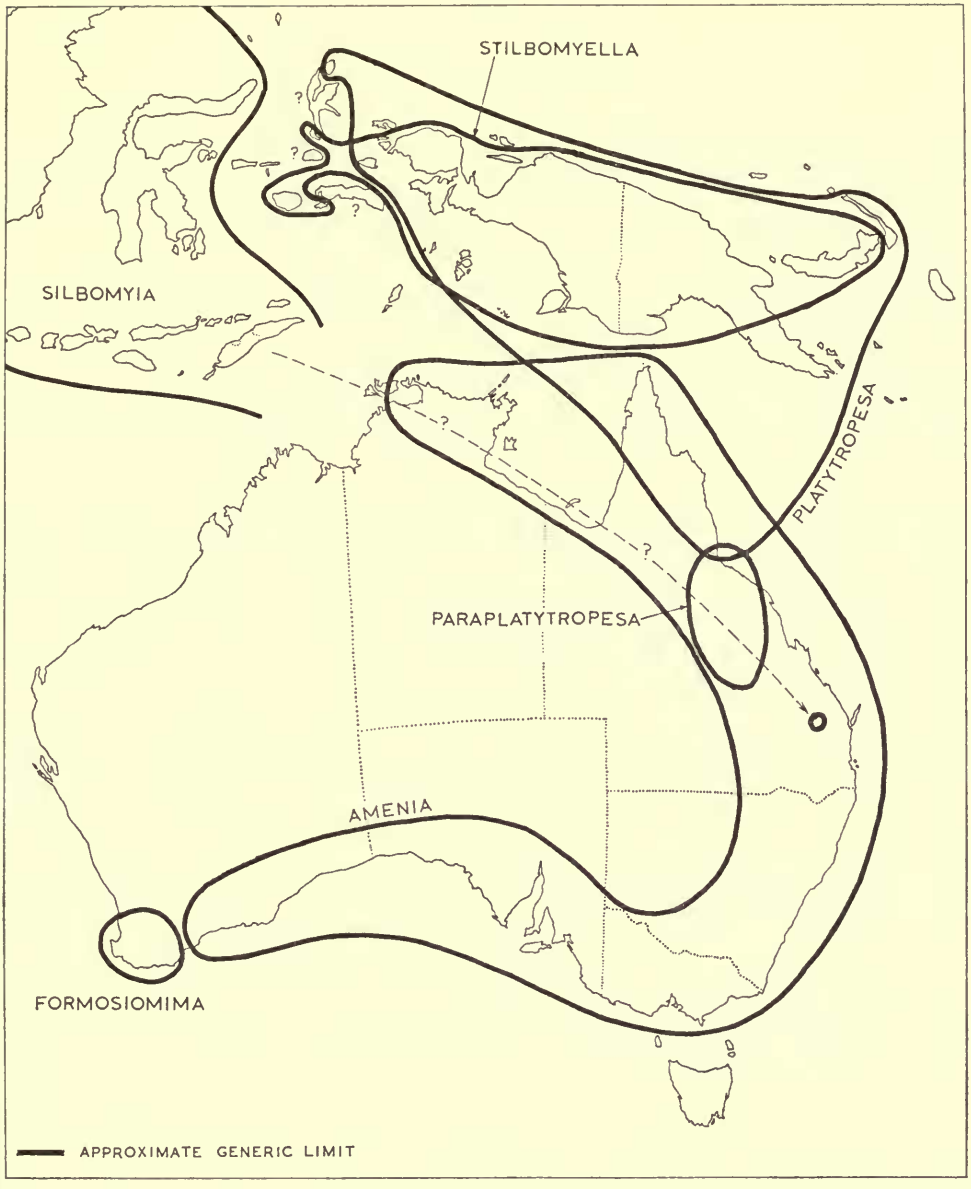
Distribution : Widespread in eastern Australia from Victoria northwards to Queensland. Hutton's (1873, 1881) record of this species from New Zealand under the name *A. parva* Schiner is erroneous, as Hutton (1900) later pointed out.

FORMOSIOMIMA Enderlein, 1936

Formosiomima Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 444. Type-species : *Formosiomima imitatrix* Enderlein, 1936 [= *Amenia nigromaculata* Malloch, 1929], by original designation.

Diagnosis. Ventral surface of costa bare between apices of veins *Sc* and R_1. Fore tibia with one *pv* seta and without *pd* setae. Cross-vein *r-m* distinctly before middle of discal cell. Body short and broad with remarkable black and whitish pattern resembling Tachinid genus *Amphibolia* Macquart. Abdominal tergites partially fused, sutures between hindmost visible tergites indistinct and without break in dense pollen cover. Marginal setae of T4 not regularly spaced as in other Ameniinae, arranged in widely separated pairs (Text-fig. 27). Scutum with pair of white sunmedian spots in addition to three marginal pairs of mesonotum. Facial carina not sexually dimorphic. ♂ eyes strongly approximated. ♂ without proclinate orbital, prevertical or outer vertical setae. Abdominal sternites of both sexes without definite strong or spiniform setae but with moderately long hair.

Discussion. *Formosiomima* is at present monotypic, containing only the single species originally described as *Amenia nigromaculata* Malloch and later described by Enderlein as *Formosiomima imitatrix*. This species differs very strikingly from all *Amenia* species not only in the remarkable *Amphibolia*-like pattern (the basis of Enderlein's name *imitatrix*) but in the partial obliteration of the sutures dorsally between the tergites and the very unusual arrangement of widely spaced pairs of marginal setae on T4 (in *Amenia* and other Ameniinae the marginal setae of T4 form an almost regular evenly spaced row) ; in my view these very exceptional characters justify the recognition of *Formosiomima* Enderlein as a genus distinct from *Amenia*. The abdominal pattern is quite differently formed from that of *Amenia* : in *Amenia* the abdomen is almost all bare and metallic with only thin silvery-white pollinosity almost entirely confined to the sides of T3 and T5 ; in *Formosiomima* most of the abdomen is very thickly and uniformly pollinose except on T1+2 and on large



spot-like areas on succeeding tergites. The areas of the abdomen in *Formosiomima* in which pollinosity is absent appear as black spots surrounded and separated by a generally pale pollinose background (Text-fig. 27) ; each of the separated pairs of marginal setae on T4 stands on a black spot. *Formosiomima* also differs from *Amenia* in the much weaker and more hair-like vestiture of the sternites, which bear no strong spiniform setae.

Distribution : Western Australia only.

Description of the Species

Formosiomima nigromaculata (Malloch, 1929) **comb. n.**

(Text-fig. 27)

Amenia nigromaculata Malloch, 1929, *Proc. Linn. Soc. N.S.W.*, **54** : 286. Holotype ♂, WESTERN AUSTRALIA. In the Division of Entomology Museum, C.S.I.R.O., Canberra. *Chaetamenia nigromaculatum* (Malloch), Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 442.

Formosiomima imitatrix Enderlein, 1936. *Veröff. dtsch. KolonMus. Bremen* **1** : 444. Holotype ♂, WESTERN AUSTRALIA. In the Zoologisches Museum der Humboldt-Universität, Berlin. **syn. n.**

Diagnosis. Diagnosis as for genus, *Formosiomima* monotypic. Immediately distinguishable from all *Amenia* species by remarkable pattern resembling that of *Amphibolia* in the Tachinidae, including presence of submedian white spots on scutum.

♂. *Head* : Interfrontal area orange or orange-yellow ; parafrontals, parafacials and genae pale orange or orange-yellow with dense golden or golden orange pollinosity ; face and epistome also yellowish orange but with thin yellowish white pollinosity ; postorbits thickly yellow to golden orange pollinose ; postbuccae semi-shining orange-yellow, inconspicuously pollinose ; occiput (except for small orange triangle behind vertex) brownish black, non-pollinose. Hair of parafrontals, genae, postbuccae and occiput entirely black. Eyes very strongly approximated and frons very narrow, upper part of interfrontal area almost eliminated but parafrontals of each side not quite meeting in mid line ; frons narrowest slightly anterior to anterior ocellus, at narrowest point about one-thirteenth (0·068–0·085) of head width. Ocellar triangle blackish, slightly raised, ocellar setae distinct. Postorbits very narrowly tapering at upper ends, occiput and long fine postocular setae just laterad of vertical setae almost abutting against eyes. Frontal setae cruciate, very weak, uppermost pairs very fine and hair like, the rows of setae reaching almost to anterior ocellus. Facial carina short and broad, antennal bases well separated and antennal foveae shallow, outer surface of carina slightly rounded and sometimes slightly sulcate ; carina shorter than distance from lunula to anterior ocellus and 1·7–2·0 times as long as epistome, latter elongate and poorly differentiated from ventral end of facial carina. Gena about two-fifths (0·39–0·43) of eye-height. Parafacial about 2·5 times as wide as third antennal segment. Antennae with first two segments mainly dark brown or black (distinction from all *Amenia* species), third segment pale orange, falling short of mouth-margin by more than their own length, third segment about 2·5 times as long as second segment ; seta on second segment shorter, arista slightly longer, than third antennal segment. Palpi yellow. *Thorax* : black, sometimes with slight bluish purple tinge round edges of spots. Mesonotum with five pairs of large boldly-marked white pollinose areas, appearance of which is fixed (not noticeably shifting with direction of light) ; five pairs of spots comprise the usual three marginal pairs, plus a pair on prescutum and a pair on scutum. Anterior pair of marginal spots are elongate, lying over humeral calli, notopleura and portion of each side of prescutum ; white marks on prescutum consist of pair of broad submedian white vittae lying just mesad of each *prst dc* row of setae and extending back almost to transverse suture ; pair of white spots on scutum large but more rounded than those on prescutum, submedian in position on posterior half of scutum, lying almost in line with prescutal white vittae. Each mesopleuron and sternopleuron with a large round white pollinose spot with fixed appearance. All thoracic white spots strongly contrasting with black background. Scutellum with four pairs of marginal setae. *Wings* : basal cells dark brown except for clear area at extreme base, wings otherwise clear hyaline. Apical half of costal margin not noticeably bowed forwards. Bend of vein *M* obtuse, distance from bend to wing margin 1·6 times as great as that between *m-cu* and bend ; on vein *M* distance from

r-m to *m-cu* 3·2–3·4 times as great as that between *m-cu* and bend. Lower calypter very dark brown except for white basal part which is hidden when wings folded back, one third of upper calypter brown and remainder opaque white. *Abdomen* : with very striking black and pale yellowish grey pattern (Text-fig. 27), the dorsum with five large bold black spots. Tergites with a thick uniform covering of pale pollinosity, usually pale yellowish grey but with a very slight greenish tinge, except for following black areas : whole of T1+2 black ; large median dorsal spot and a pair of small lateral spots on T3 black ; large median spots, pair of large sublateral spots and a pair of smaller lateral spots on T4 black ; large postero-median subtriangular area on T5 black ; in addition ventral ends of T4 and T5 black adjacent to sternites. All sternites black. Lateral and sublateral pairs of black spots on T4 sometimes nearly or just confluent ; median black spots of T3 and T4 variable in size, but set against hind margin and not reaching fore margin of each tergite. Sutures between T3 and T4, T4 and T5 almost obliterated dorsally with the pale pollinosity appearing continuous between the tergites. All black spots and T1+2 with dark purple or violaceous tinge in some lights under microscopic examination, but appearing quite black to naked eye. Median marginal setae of T3 variable, usually four but sometimes one pair only or number irregular, three or five. Transverse row of marginal setae on T4 irregular, setae standing in pairs on black spots with distinct spaces between each pair. Dorsal abdominal hair long and very fine ; hair of sternites long and strong but not at all spiniform. *Measurements* : body length 10·9, 11·0 mm., wing length 10·4, 10·5 mm. [2 specimens].

♀. Very similar to ♂ except for broad frons and broader parafacials. Interfrontal area in specimen seen 0·85 times as wide as one parafrontal at level of lowest proclinate orbital seta, parafrontals very broad and each bearing two or three proclinate orbital setae. Vertex seen from above slightly narrower than one eye, by measurement eye-vertex-eye ratio 27 : 25 : 27. Gena 0·44 of eye-height. Parafacial about 3·75 times as wide as third antennal segment. Mid tibia with four strong *ad* setae and some smaller setae interspersed in the one specimen seen.

MATERIAL EXAMINED. *Formosiomima imitatrix* Enderlain, holotype ♂, AUSTRALIA : Western Australia, Swan River (*von Preiss*).

AUSTRALIA : 1 ♂, Western Australia, Garden I., 23.viii.1959 (*Mackerras*) (B.M. Nat. Hist.) ; 1 ♀ ,Western Australia, Pt. Peron, 29.viii.1933 (*K. R. Norris*) (B.M. Nat. Hist.).

The holotype of *Amenia nigromaculata* Malloch has not been seen but this is an unmistakable species ; the two specimens mentioned above (other than *imitatrix* type) have been compared with *nigromaculata* type in Canberra and are each labelled " Paramonov det. Amenia nigromaculata Mall. compared with type ". The data of *nigromaculata* holotype are : ♂, Western Australia, Perth, 1.xi.1924 (*Nicholson*).

Distribution : Known only from the south-western part of the state of Western Australia. Paramonov (1957) has recorded several localities for this species, all in the general area of Perth.

Tribe **PARAMENIINI** Enderlein

PARAMENIINI Enderlein, 1936, *Veröff. dtsch. KolonMus. Bremen* **1** : 446.

DIAGNOSIS. Ameniinae with following characters : Head without facial carina. Prescutum with outer posthumeral seta situated laterad of presutural seta or in line with it (Text-fig. 10). Hind tibia without definite *pv* apical seta. Prosternum and propleuron bare or at most with a few very short fine inconspicuous hairs.

Type-genus : *Paramenia* Brauer and Bergenstamm, 1889.

The tribe Parameniini is at present monogeneric for *Paramenia*.

PARAMENIA Brauer and Bergenstamm, 1889

Paramenia Brauer and Bergenstamm, 1889, *Denkschr. Akad. Wiss. Wien* **56** : 151. Type-species : *Paramenia semiauriceps* Brauer and Bergenstamm, 1889, by monotypy.

Calliphoropsis Townsend, 1915, *Proc. biol. Soc. Wash.*, **28** : 22. Type-species : *Musca maculatis* Walker, 1859, by original designation.

Diagnosis. Diagnostic characters as for tribe, following additional characters may be noted : Ventral surface of costa bare between apices of *Sc* and R_1. Fore tibia with one *pv* and without *pd* setae. Both sexes with strong spinous setae on abdominal sternites. ♂ with eyes approximated and frons narrow, without outer vertical, prevertical or proclinate orbital setae.

Discussion. Malloch (1928a) synonymised the species on which *Paramenia* and *Calliphoropsis* are based, and thus treated the genera as isogenotypic synonyms. The synonymy of the genera is upheld in the present treatment as the type-species are unquestionably congeneric ; but *maculatis* from the Aru Islands and *semiauriceps* from the Australian mainland, although superficially extremely alike, differ constantly in major characters of the head and it appears best to regard them as distinct species in the absence of good evidence of conspecificity. In addition to these two species, one new species is here described and *divitiosa* Walker (originally described in *Chrysomya* Robineau-Desvoidy) is newly-assigned to *Paramenia* (comb. n.) ; thus four species of *Paramenia* are here recognised.

Townsend (1931) accepted Malloch's synonymy of *semiauriceps* and *maculatis* and cited *Calliphoropsis* Townsend as a synonym of *Paramenia*, but later (Townsend, 1935, 1937), without explanation, treated the two genera as distinct. Enderlein (1936, p. 438) remarked that *Calliphoropsis* Townsend was unknown to him, but appears to have overlooked Malloch's (1928a) and Townsend's (1931) synonymy of this genus with *Paramenia*, for he omits any mention of *Calliphoropsis* in his brief treatment of Parameniini (p. 446). The assignment of *divitiosa* Walker and *maculatis* Walker to *Lucilia* Robineau-Desvoidy by Wulp (1896) is erroneous.

Specimens of *Paramenia* vary in the development of short fine inconspicuous hair on the propleuron and prosternum, but there is no evidence that the presence or absence of hairs on these sclerites is of any value as a systematic character.

Distribution : *Paramenia* occurs from Misoöl and the Aru Islands through parts of Indonesian New Guinea to Papua and Queensland ; in Australia *Paramenia* is most abundant in Queensland, but the range extends into New South Wales, and one specimen is known from Victoria (Paramonov, 1957, p. 61). Engel (1925, p. 348) recorded *Paramenia* (identified as *semiauriceps*) from Celebes, but confirmation is needed that the genus occurs here : the two specimens (actually belonging to *P. divitiosa*) on which Engel based this record have been seen ; each bears the single word " Celebes " without other data, and the validity of the labels appears very doubtful.

Key to the Species

(1) Males

1 Eyes almost meeting in mid-line, frons reduced to very narrow strip at most only as wide as anterior ocellus. Upper third of frons anterior to ocelli without frontal hairs. Colour dark purple or bluish purple. [Queensland] . ***P. angustifrons*** sp. n. (p. 128)

– Eyes distinctly separated, frons as wide as or almost as wide as third antennal segment (about three times as wide as anterior ocellus). Frons with crossed frontal hairs reaching almost to level of anterior ocellus. Colour dark green or greenish blue in material seen (probably sometimes purplish in *divitiosa*) 2

2 Parafacials almost entirely silvery white, only narrowly golden adjacent to genae, and parafrontals pale silvery greyish. White pollinosity on scutum in area of supra-alar setae very inconspicuous, not forming spots obvious to naked eye. Dorsum of T3 with distinct covering of white pollinosity easily visible from behind. [New Guinea and Misoöl] . . . . . ***P. divitiosa*** (Walker) (p. 130)

– Parafacials and parafrontals entirely yellow to deep golden. White pollinosity on scutum in area of supra-alar setae forming conspicuous white spots distinct to naked eye. Dorsum of T3 without noticeable white pollinosity from any point of view, white pollen on this tergite confined to lateral areas 3

3 Eyes large and genae correspondingly narrow (Text-fig. 50), gena in profile only 0·16–0·17 of eye height. Third antennal segment 5·1–5·5 times as long as second segment ; antennae falling short of mouth-margin by not more than half the length of third segment. Parafacial not strongly widening towards gena, at mid-height only twice as wide as third antennal segment. [Aru Islands]
P. macularis (Walker) (p. 131)

– Eyes smaller and genae broader (Text-fig. 49), gena in profile 0·27–0·29 of eye-height. Third antennal segment 4·0–4·4 times as long as second segment ; antennae falling short of mouth-margin by at least two-thirds of length of third segment. Parafacial strongly widening towards gena, at mid-height two and a half or three times as wide as third antennal segment. [Australia]
P. semiauriceps Brauer and Bergenstamm (p. 133)

(2) Females

1 Mid tibia with one strong isolated submedian *ad* seta 2

– Mid tibia with two or three *ad* setae, basal one sometimes weak but always distinct 3

2 Colour violet purple. Gena very narrow, in profile 0·21–0·23 of eye-height. Third antennal segment 5·0–5·1 times as long as second segment ***P. angustifrons*** sp. n. (p.128)

– Colour blue with slight green tinge. Gena broader, in profile 0·26–0·28 of eye-height. Third antennal segment 4·6–4·8 times as long as second segment
? new species (see p. 136)

3 Parafacial almost entirely silvery white, only narrowly yellow or golden adjacent to gena. Eyes very long, gena in profile only 0·18–0·21 of eye-height. Colour purple or dark blue in material seen . . ***P. divitiosa*** (Walker) (p. 130)

– Parafacial yellow or golden on lower half or more, only upper half or third silvery white. Eyes slightly or conspicuously smaller, gena in profile 0·22–0·35 of eye-height. Colour almost always dark green or bluish green 4

4 Eyes smaller and gena correspondingly broad, gena in profile about a third (0·31–0·35) of eye-height. Third antennal segment 5·4–6·2 times as long as second segment. Vertex broader, from above 0·60–0·66 of width of one eye. [Australia]
P. semiauriceps Brauer and Bergenstamm (p. 133)

– Eyes larger, gena in profile about a quarter (0·22–0·25) of eye-height. Third antennal segment 6·5–7·0 times as long as second segment. Vertex narrower, from above 0·48–0·55 of width of one eye. [Aru Islands] . . ***P. macularis*** (Walker) (p. 131)

Descriptions of the Species

Note : the following characters of colour and pollinosity are common to all species and are therefore omitted from the individual descriptions :—Legs black (with slight metallic reflections on femora of same colour as body). Lower calypter mainly black-brown, only white on extreme base which is hidden by upper calypter ; upper calypter opaque white on outer part with some pale brown infuscation on inner part (in wings-folded position). Mesopleuron and sternopleuron each with a very large thickly white pollinose spot occupying most of the sclerite. Abdominal T3 on each side with an area of shining white pollen, appearance of the lateral white spots shifting with light. Abdominal T5 with a pair of very large white pollinose areas occupying most of sides of tergite and nearly meeting one another mid-dorsally, appearance shifting with direction of light but spots very conspicuous from behind.

Paramenia angustifrons sp. n.

(Text-figs. 45, 48)

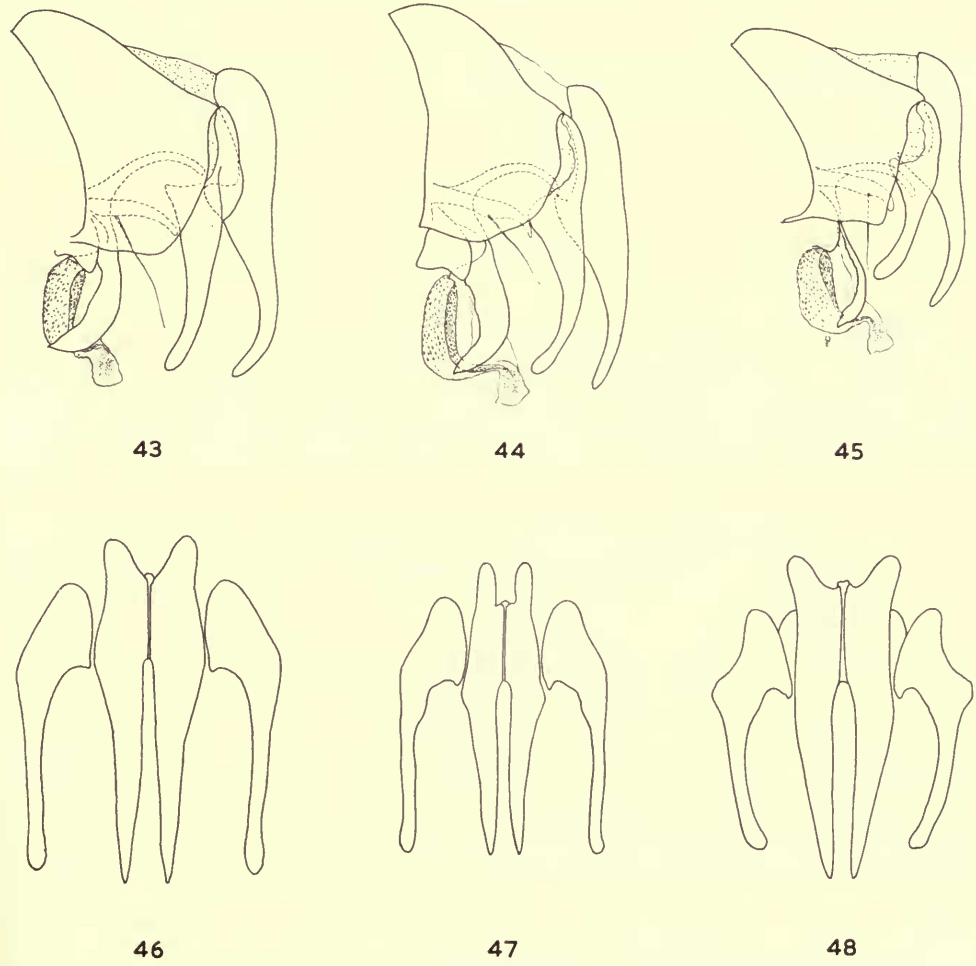
Diagnosis. ♂ eyes nearly meeting, upper part of frons almost obliterated and without frontal hairs ; ♀ with only one *ad* seta on mid tibia *and* with gena less than one quarter of eye-height. General colour violet-purple.

♂. *Head* : Interfrontal area dark brown. Parafrontals pale yellowish grey or silvery grey pollinose ; parafacials and genae bright yellow or deep golden pollinose, the yellow colour of upper parafacials merging gradually into greyish colour of parafrontals ; facialia and peristomal strip blackish brown ; epistome yellowish ; face with blackish ground colour under antennae, more yellowish towards epistome, with thin white pollinosity ; postorbits densely silvery white pollinose ; occiput black with thin white pollen covering. Genal hair golden yellow. Eyes very strongly approximated, almost meeting in mid-line and upper part of frons reduced to very narrow strip only about as wide as anterior ocellus. Cruciate frontal setae weak, uppermost pairs very short fine and hair-like, frontal hairs absent altogether from upper third of frons below anterior ocellus. Eyes in profile very elongate, gena only 0·17–0·19 of eye-height. Parafacial at mid-point about one and a half times as wide as third antennal segment. Antennae blackish brown, third segment 4·0–4·2 times as long as second segment and falling short of mouth-margin by about half its length. Palpi yellowish brown. *Thorax* : mainly dark purple or violet-purple, sometimes with traces of bluish green colour on prescutum and scutum or around sternopleural spot. Dorsum with very distinct thin white pollen covering when seen from behind, white pollinosity thickest around margins of mesonotum, that in areas of supra-alar setae distinct to naked eye. *Wings* : clear hyaline, except for usual slight darkening at extreme base. *Legs* : mid tibia with a single strong *ad* seta which is not preceded by any smaller *ad* setae. *Abdomen* : dark purple or violet-purple, sometimes blue-violet. Dorsum of T3 seen from behind shining and without trace of any covering of white pollinosity. T3 either without median marginal setae or with one or a pair (as in holotype) of such setae very weakly developed. Hair of T5 very long and exceedingly fine, hairs hardly at all thickened towards their bases. ♂ hypopygium as in Text-figs. 45 and 48. *Measurements* : body length 10·4 mm. (range 9·2–11·7 mm.), wing length 10·1 mm. (range 8·9–11·4 mm.) [5 specimens].

♀. Generally like ♂ except for details of head. Lower half of parafacials golden and upper half (like the parafrontals) silvery white. Gena 0·21–0·23 of eye-height. Antennae more elongate than in ♂, third segment 5·0–5·1 times as long as second segment and falling short of mouth-margin by only about one third of its length. Vertex about four-sevenths (0·55–0·59)

of width of one eye viewed from above. Parafacial at mid-point about twice as wide as third antennal segment. Mid tibia as in ♂ with only one isolated *ad* seta (cf. *semiauriceps*). *Measurements* : body length 11·8 mm. (range 11·2–12·4 mm.), wing length 10·6 mm. (range 9·8–11·6 mm.) [4 specimens].

MATERIAL EXAMINED. Holotype ♂, AUSTRALIA : Queensland, Kuranda (*F. P. Dodd*). In the Division of Entomology Museum, C.S.I.R.O., Canberra. Paratypes : AUSTRALIA : 1 ♀, data as for holotype (Div. Ent. Mus. Canberra) ; 1 ♂, 2 ♀♀, data as for holotype (B.M. Nat. Hist.) ; 2 ♂♂, Queensland, Kuranda, ix.1910 (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♀, Queensland, Townsville (*F. P. Dodd*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Herberton, 3,700 ft., xi.1911 (*Dodd*) (U.S. Nat. Mus.).



FIGS. 43–48. ♂ hypopygium (lateral view) and mesolobes and paralobes (posterior view) of *Paramenia* : (43 and 46) *P. divitiosa* (Walker). (44 and 47) *P. macularis* (Walker). (45 and 48) *P. angustifrons* sp. n.

The specimen from Herberton in U.S. Nat. Mus. bears a determination label by Engel as ' semiauriceps ' and one by Townsend as ' macularis '. Engel (1925) and Enderlein (1936) both record two specimens of *Paramenia* from Herberton with data identical to that of the specimen in U.S. Nat. Mus. ; these specimens have not been seen but from Enderlein's brief description (Enderlein, 1936, p. 446, under the non-existent erroneous name ' P. auriceps B.B.') almost certainly belong to *P. angustifrons* sp. n. Paramonov's (1957) record of *P. macularis* from Kuranda, Queensland, refers to this species.

Distribution : Known only from the localities cited above in northern Queensland. To judge from the limited amount of material so far available the range appears to lie to the north of, and not to overlap with, that of *P. semiauriceps*.

Affinities. *P. angustifrons* sp. n. is undoubtedly a true *Paramenia* but stands slightly apart from other species because of the exceedingly narrow ♂ frons and presence of only one *ad* seta on the ♀ mid tibia ; it is easily distinguished from *P. semiauriceps*, the only other Australian species, also by the purplish colour and by the much narrower gena and more elongate eye.

Paramenia divitiosa (Walker, 1864) **comb. n.**

(Text-figs. 43, 46)

Chrysomyia divitiosa Walker, 1864, *Proc. Linn. Soc. Lond.* (*Zool.*), **7** : 215. Holotype ♀, MYSOL (= MISOÖL). In the British Museum (Natural History), London.

Diagnosis. Parafacials of both sexes almost entirely silvery white, only very narrowly golden yellow for about lower sixth or seventh adjacent to genae. White pollinosity on scutum in areas of supra-alar setae inconspicuous, not forming white spots obvious to naked eye.

♂. *Head* : Interfrontal area dark reddish brown. Parafrontals and almost all of parafacials densely silvery white pollinose ; extreme ventral ends of parafacials (about lower seventh) and all of genae golden yellow pollinose ; facialia blackish brown with thin whitish pollinosity ; epistome and lower face pale reddish yellow ; upper face beneath antennae with blackish ground colour covered by thin greyish white pollen ; postorbits thickly creamy white pollinose ; occiput black with thin whitish pollinosity. Genal hair golden yellow. Eyes conspicuously separated, frons at narrowest point nearly as wide as third antennal segment and about three times as wide as anterior ocellus, parafrontals of each side meeting in mid-line and upper interfrontal area therefore entirely occluded. Lowest pairs of cruciate frontal setae well developed but uppermost pairs fine and hair-like and reaching to level of anterior ocellus. Eyes in profile very elongate, gena only 0·17 of eye-height. Parafacial at mid-point twice as wide as third antennal segment. Antennae very dark reddish brown, third segment 5·7 times as long as second segment and falling short of mouth-margin by about two-fifths of its length. Palpi yellow brown. *Thorax* : dark greenish blue with traces of violet on mesonotum and scutellum (probably sometimes entirely purplish). Dorsum with thin but distinct covering of white pollinosity when seen from behind, pollen thicker round margins of mesonotum but that in areas of supra-alar setae not forming spots conspicuous to naked eye. *Wings* : almost clear hyaline, very faintest trace of yellowish brown tinge in addition to usual basal darkening. *Legs* : mid tibia with two *ad* setae. *Abdomen* : dark greenish blue with violaceous reflections, especially ventrally ; T3 with traces of a black median vitta in some lights. Dorsal surface of T3 with a conspicuous covering of white pollinosity when seen from behind, pollen on most of dorsum

except for median dark vitta. T3 without median marginal setae. Hair of T3 and T4 all recumbent, that of T5 erect and fine. ♂ hypopygium as in Text-figs. 43 and 46. *Measurements* : body length 12·3 mm., wing length 10·0 mm. [1 specimen].

♀. General colour from dark greenish blue to dark purplish, holotype specimen purple. Agreeing with ♂ in having almost entirely silvery white parafacials with golden colour confined to lower sixth adjacent to genae. Gena 0·18–0·21 of eye-height. Antennae with third segment 5·9–6·3 times as long as second segment, falling short of mouth-margin by a little under one third of length of third segment. Vertex only about half (0·48–0·55) as wide as one eye viewed from above. Parafacial at mid-point about two and a half times as wide as third antennal segment. Mid tibia almost always with three *ad* setae of which basal one small, occasionally only two, one specimen seen with four. *Measurements* : body length 13·5 mm. (range 12·2–15·1 mm.), wing length 11·9 mm. (range 10·8–13·2 mm.) [8 specimens].

Material examined. Holotype ♀, Misoöl Island (Indonesian New Guinea) (*A. R. Wallace*).

Indonesian New Guinea : 3 ♀♀, Fak-Fak (*A. E. Pratt*) (B.M. Nat. Hist.) ; 1 ♀, Bernhard Camp, 50 m., 22.xii.1938 (*Neth. Ind.–American N. Guin. Expedit. J. Olthof*) (Rijksmus. Leiden).

New Guinea (presumed Indonesian but no accurate data) : 1 ♀ (*Macke*) (Rijksmus. Leiden) ; 2 ♀♀ (*A. R. Wallace*) (B.M. Nat. Hist.).

In addition to foregoing material : 1 ♂, 1 ♀ in Staatl. Mus. Stuttgart, each labelled " Celebes " without other data, but this label probably erroneous ; these specimens recorded by Engel (1925, p. 348) erroneously as *P. semiauriceps* B.B.

Distribution : Probably confined to the western part of Indonesian New Guinea with its adjacent islands (including Misoöl, the type-locality), but the small amount of material seen is poorly labelled so that exact localities cannot be fixed. The ♀ specimen of *Paramenia* recorded under the name ' P. auriceps ' [sic] by Enderlein (1936) from the Central Range, Dutch New Guinea, has not been seen but is almost certainly this species.

Affinities. Most closely allied to *P. macularis* (Walker), with similar long eye and narrow gena and with vertex of same width in ♀, but distinguished by almost all silvery white parafacials ; antennae slightly longer than in *macularis*.

Paramenia macularis (Walker, 1859)

(Text-figs. 44, 47, 50)

Musca macularis Walker, 1859, *Proc. Linn. Soc. Lond* (*Zool.*), **3** : 104. Lectotype ♂, ARU ISLANDS. In the British Museum (Natural History), London. *Paramenia macularis* (Walker), Malloch, 1928, *Proc. Linn. Soc. N.S.W.*, **53** : 330.

Lectotype Designation : the type-material of *Musca macularis* Walker consists of one ♂ and two ♀ syntypes in B.M. Nat. Hist. The ♂ syntype has been labelled and is here designated as lectotype.

Diagnosis. ♂ eyes separated by width of third antennal segment, parafacials entirely yellow and gena one-sixth of eye-height ; ♀ mid tibia with two or more *ad* setae, only upper third or half of parafacial white, gena about a quarter of eye-height and third antennal segment at least 6·5 times as long as second.

♂. *Head* : Interfrontal area dark reddish brown. Parafrontals pale or lemon yellow pollinose ; parafacials entirely yellow to deep golden pollinose, very slightly paler towards parafrontals ; genae golden yellow pollinose ; facialia blackish brown near vibrissae and on inner parts, more reddish yellow on facial ridges themselves, with thin whitish pollinosity ; epistome and lower face reddish yellow, upper face with brownish or blackish ground colour thinly obscured by whitish pollinosity ; postorbits silvery white pollinose ; occiput blackish with dark green metallic tinge, thinly covered with whitish pollinosity. Genal hair yellow or golden orange. Eyes well separated, frons at narrowest about as wide as third antennal segment, parafrontals on upper part of frons more or less meeting in mid-line. Crossed frontal setae moderately strong near lunula but becoming very fine, short and hair-like towards anterior ocellus, parafrontals near anterior ocellus with some fine hairs more or less in continuation with crossed frontal hairs. Gena narrow, 0·16–0·17 of eye-height. Parafacial at mid-point about twice as wide as third antennal segment or slightly less. Antennae dark reddish brown, third segment 5·1–5·5 times as long as second segment and falling short of mouth-margin by about two-fifths of its length. Palpi reddish yellow. *Thorax* : dark green or bluish green, mesonotum sometimes with coppery tinge and scutellum sometimes more bluish. White pollen on mesonotum very thin and inconspicuous except marginally, most of scutum with scarcely any trace of white pollinosity except for usual patches in areas of supra-alar setae and these not forming white spots conspicuous to naked eye (cf. *semiauriceps*). *Wings* : with a faint but definite yellowish brown tinge, due mainly to slight yellowish infuscation along veins. *Legs* : mid tibia with two strong *ad* setae, proximal one very distinct. *Abdomen* : shining dark green, blue green or blue with traces of violet colour. T3 without definite white pollinosity on dorsum of T3, with only very faintest traces visible from behind. T3 without median marginal setae. Hair of T3 and T4 entirely recumbent, that of T5 long fine and erect. ♂ hypopygium as in figs. 44 and 47. *Measurements* : body length 11·8 mm. (range 11·2–12·9 mm.), wing length 9·6 mm. (range 8·9–10·6 mm.) [3 specimens].

♀. Differing from ♂ in having parafrontals and upper third or half of parafacials silvery white pollinose ; extreme upper ends of parafrontals sometimes very thinly pollinose and appearing metallic dark green. Gena 0·22–0·25 of eye-height. Antennae very elongate, third segment 6·5–7·0 times as long as second segment and falling short of mouth-margin by about a third of its length or a little less. Vertex only about half (0·48–0·55) as wide as one eye viewed from above. Parafacial at mid-point about two and a half times as wide as third antennal segment. Mid tibia with two strong *ad* setae, sometimes a small third *ad* seta in addition nearer the base. *Measurements* : body length 13·3 mm. (range 12·4–14·2 mm.), wing length 11·4 mm. (range 10·4–12·3 mm.) [8 specimens].

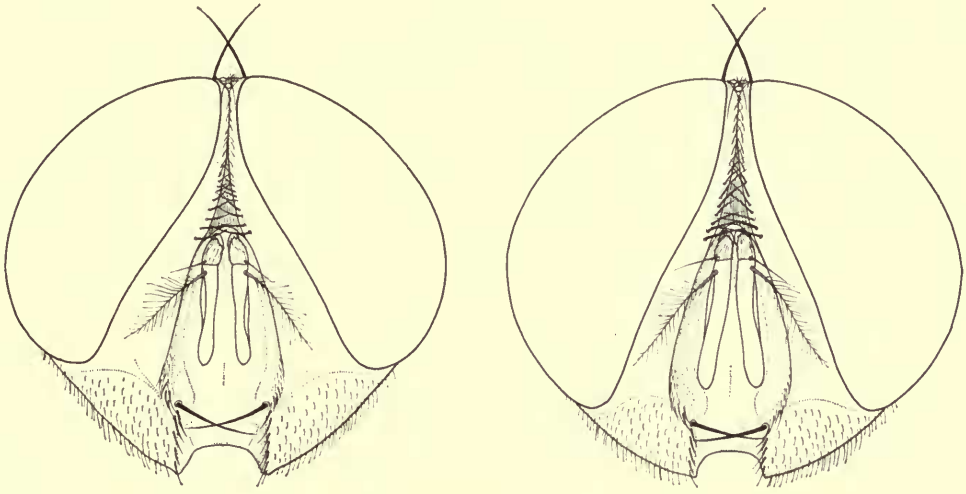
MATERIAL EXAMINED. Lectotype ♂, ARU ISLANDS : (*A. R. Wallace*) ; paralectotypes : 2 ♀♀, data as for lectotype.

ARU ISLANDS : 1 ♂, 3 ♀♀, Aru Islands (no other data) (*ex coll. Bigot*, B.M. Nat. Hist.) ; 1 ♂, 3 ♀♀, Aru Islands, 1911 (*Elger, W. W. Froggatt coll.*)(Div. Ent. Mus. Canberra). Last four specimens are those already recorded in the literature by Paramonov (1957) from Aru Islands.

In addition two specimens have been seen whose identity is doubtful, but which I tentatively associate with *macularis*. The data are : 2 ♀♀, NEW GUINEA : Bivak (= Biak) Island, xii.1909 and i.1910 (*Lorentz*) (B.M. Nat. Hist. and Rijksmus. Leiden) ; these two females differ from typical *macularis* from the Aru Islands by having more distinctly reddish antennae and paler yellow genae, by the possession of a small *pd* seta on the fore tibia (absent in all other *Paramenia* seen), by the slightly shorter antennae with third segment 6·0–6·2 times as long as second, by very slightly broader gena and vertex and slightly narrower parafacials. They may represent a new species, but for the present there is insufficient evidence of this.

Distribution : Only certainly known to occur in Aru Islands. All material recorded by earlier authors from Australia as *P. macularis* belongs to *P. semiauriceps*.

Affinities. Probably closest to *P. divitiosa* (Walker), to judge from similarity of structural proportions of head, but superficially much more closely resembling *P. semiauriceps* Brauer and Bergenstamm. *P. macularis* is easily distinguished from *P. divitiosa* by the extent of yellow coloration on the parafacials (all yellow in ♂, half or two-thirds yellow in ♀) ; differences from *P. semiauriceps* are discussed under this species.



49 50

Figs. 49 and 50. ♂ head in facial view of (49) *Paramenia semiauriceps* Brauer and Bergenstamm and (50) *Paramenia macularis* (Walker).

Paramenia semiauriceps Brauer and Bergenstamm, 1889

(Text-fig. 49)

Paramenia semiauriceps Brauer and Bergenstamm, 1889, *Denkschr. Akad. Wiss. Wien* **56** : 151, 171. Holotype ♀, AUSTRALIA (citation of New Zealand by Brauer and Bergenstamm, *op. cit.* p. 171 in error). In the Naturhistorisches Museum, Vienna.

Diagnosis. ♂ eyes separated by width of third antennal segment, parafacials entirely yellow and gena two-sevenths of eye-height ; ♀ mid tibia with two or three *ad* setae, upper half of parafacial silvery white, gena one-third of eye-height.

♂. *Head* : Interfrontal area red-brown. Parafrontals bright yellow pollinose ; parafacials and genae bright yellow or golden yellow pollinose ; facialia mainly pale to dark reddish brown, sometimes slightly blackish near vibrissae, with thin white pollinosity, more reddish yellow with yellow pollinosity on outer facial ridges ; epistome and lower face reddish yellow, upper face more reddish to blackish brown under a thin covering of whitish pollinosity ; postorbits white or silvery white pollinose, sometimes very slightly creamy white ; occiput black with thin white pollinosity. Genal hair bright yellow. Eyes distinctly separated, frons at narrowest point as

wide as or slightly wider than third antennal segment, upper parafrontals meeting one another in mid-line and upper part of interfrontal area therefore completely occluded. Cruciate frontal setae rather weak, becoming very weak and hair-like towards anterior ocellus but reaching more or less to level of latter. Eye unusually short and gena correspondingly broad, gena in profile 0·27–0·29 of eye-height. Parafacial very conspicuously widening ventrally towards gena, at mid-point two and a half or three times as wide as third antennal segment. Antennae very dark reddish brown or blackish brown, third segment only 4·0–4·4 times as long as second segment and falling short of mouth-margin by about three-quarters of its length. Palpi brownish yellow. *Thorax* : usually dark green, sometimes with coppery reflections, but sometimes bluish green ; scutellum often more distinctly blue than mesonotum, and sometimes violet blue. Mesonotum with general covering of white pollinosity extremely thin and inconspicuous, but scutum on each side in area of supra-alar setae with an elongate densely white pollinose spot which is very conspicuous to naked eye and sharply defined. *Wings* : clear hyaline. *Legs*: almost always with only one isolated *ad* seta, very occasionally with a second much smaller seta nearer the base. *Abdomen* : from shining dark green, sometimes with reddish copper tinge, to violet blue, often more distinctly blue than thorax ; ventral surface usually rather blue in specimens with green dorsum and violet in specimens with blue dorsum. Dorsum of T3 hardly at all pollinose, only with very thinnest traces in some lights. T3 without median marginal setae. Hair of mid dorsum of T3 and T4 very short and semi-erect or erect, only recumbent dorsally on sides of these tergites ; hair of T5 fine and erect. ♂ hypopygium very similar to that of *P. maculatis* (Text-figs. 44 and 47). *Measurements* : body length 12·1 mm. (range 10·0–13·9 mm.), wing length 11·0 mm. (range 9·4–12·3 mm.) [12 specimens].

♀. Differing from ♂ in having parafrontals and upper half of parafacials silvery white. Gena unusually broad, 0·31–0·35 of eye-height. Antennae with third segment 5·4–6·2 times as long as second segment and falling short of mouth-margin by nearly half the length of third segment. Vertex slightly broader than in other species, 0·59–0·66 of width of one eye viewed from above. Parafacial at mid-point about three times as wide as third antennal segment. Mid tibia with two strong *ad* setae, sometimes with a third much smaller *ad* seta nearer the base. *Measurements* : body length 12·5 mm. (range 10·4–14·5 mm.), wing length 10·6 mm. (range 8·7–12·2 mm.) [12 specimens].

MATERIAL EXAMINED. Holotype ♀, AUSTRALIA : Port Denison, 1868 (*Thorey*).

AUSTRALIA : 1 ♂, Queensland, Hayman Island, 18.x.1950 (*R. Dobson*) (Div. Ent. Mus. Canberra) ; 1 ♂, Queensland, Eidsvold (B.M. Nat. Hist.) ; 1 ♀, Queensland, Eidsvold, x.1929–iv.1930 (*T. L. Bancroft*) (Div. Ent. Mus. Canberra) ; 1 ♀, Queensland Eidsvold (Div. Ent. Mus. Canberra) ; 1 ♀, Queensland, Burpengarry (*T. L. Bancroft*) (B.M. Nat. Hist.) ; 1 ♂, 1 ♀, Queensland, Mt. Gravatt, 28.ii.1916 (*T. Batchelor*) (B.M. Nat. Hist.) ; 1 ♀, Queensland, Stanthorpe, 26.x.1926 (B.M. Nat. Hist.) ; 1 ♂, Queensland, Mt. Gravatt, 19.ii.1915 (*T. Batchelor*) (B.M. Nat. Hist.) ; 1 ♀, Queensland, Botanic Gardens, 9.v.1916 (*H. Jarvis*) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Tweed Hds., 9.xi.1910 (*Batchelor*) (B.M. Nat. Hist.) ; 2 ♂♂, Queensland, Stradbroke, 20.ix. 1915 (*J. C. Bridwell*) (U.S. Nat. Mus.) ; 1 ♂, Queensland, Stradbroke Island, 5.xii. 1913 (*H. Hacker*) (U.S. Nat. Mus.) ; 1 ♂, 11 ♀♀, Queensland, Yeppoon, 28.iii.1950 (*I. F. B. Common*) (Div. Ent. Mus. Canberra) ; 3 ♀♀, Queensland, Yeppoon, 28.iii. 1950 (*I. F. B. Common*) (B.M. Nat. Hist.) ; 2 ♂♂, Queensland, Yeppoon, 20 & 27.xii. 1961 (*I. F. B. Common*) (Div. Ent. Mus. Canberra) ; 2 ♂♂, Fairy Bower, Rockhampton, 15.i.1962 (*I. F. B. Common*) (Div. Ent. Mus. Canberra) ; 1 ♂, Olsen's Caves, 13 mls. N. of Rockhampton, 25.iii. 1950 (*I. F. B. Common*) (Div. Ent. Mus. Canberra) ; 1 ♂, 2 ♀♀, Queensland, Palm Is., 20.xii.1930–6.i.1931 (*I. M. Mackerras*) (Div. Ent. Mus. Canberra) ; 1 ♀, Queensland, Palm Is., 20.xii.1930–6.i.1931 (*I. M.*

Mackerras) (B.M. Nat. Hist.) ; 1 ♂, Queensland, Palm Is., xii.1931 (*Mackerras*) (Div. Ent. Mus. Canberra) ; 1 ♀, Queensland, Wallaville, 1933 (Div. Ent. Mus. Canberra) ; 1 ♀, New South Wales, Gooranbong, 26.ii.1950 (*B. McMillan*) (B.M. Nat. Hist.) ; 1 ♀, New South Wales, Collaroy, 2.i.1959 (*K. R. Norris*) (Div. Ent. Mus. Canberra) ; 2 ♂♂, New South Wales, Sydney (*Bridwell*) (U.S. Nat. Mus.) ; 1 ♂ New South Wales, Toronto, Filmer (*Health Dept.*) (B.M. Nat. Hist.) ; 1 ♀, labelled ' N. Holl.' [=Australia], *ex coll. Bigot* (B.M. Nat. Hist.).

In addition to the foregoing material one specimen has been seen which is larger than typical *semiauriceps* and, although a ♀, has only a single isolated *ad* seta on middle tibia. This specimen is tentatively assigned to *semiauriceps* ; the data are : 1 ♀, Queensland, Byfield, 22.i.1961 (*I. F. B. Common*) (Div. Ent. Mus. Canberra).

Distribution : *P. semiauriceps* is confined to eastern Australia, where it occurs most commonly in southern Queensland ; a few specimens are known from New South Wales, and Paramonov (1957) has recorded a specimen—under the name *P. macularis*—from Elsternwick, Victoria. *P. semiauriceps* appears to be absent from northern Queensland, and to be replaced in the Kuranda area by *P. angustifrons* sp. n. ; the most northerly known localities of *P. semiauriceps* in Queensland are the off-shore islands, Hayman, Magnetic and Palm Island, and on the Queensland mainland *P. semiauriceps* is not yet known further north than Yeppoon (23° 05′ S.).

Australian specimens of *Paramenia* recorded by Malloch (1928a) and Paramonov (1957) as *P. macularis* are all *P. semiauriceps*, and specimens recorded as *semiauriceps* by Engel (1925) and Enderlein (1936) from localities outside Australia belong to other species.

Brauer and Bergenstamm (1889, p. 171) cited New Zealand as the type-locality of *semiauriceps* in the original description, but this is clearly an inadvertant error as on an earlier page (*op. cit.* p. 151), where the generic description of *Paramenia* is given, they correctly cite ' Neuholland ' (= Australia).

Affinities. *P. semiauriceps* is close to, and superficially extremely similar to, *P. macularis* (with which it was synonymised by Malloch, 1928a) ; however the differences indicated in the foregoing key to species are constant and of some magnitude and justify the recognition of two distinct species, at least for the present. In addition to the differences in the eye size, width of gena, length of antennae, width of parafacial and width of vertex, the following differences between *macularis* and *semiauriceps* should be noted : in *semiauriceps* the wings are clear hyaline, but in *macularis* have a faint though distinct yellowish brown tinge ; in *semiauriceps* the white pollinose lateral spots on the scutum are very boldly marked and obvious to the naked eye, whereas in *macularis* they are only faintly indicated and very indefinite to naked eye ; in the ♂ of *semiauriceps* the hair in the mid dorsum of abdominal tergites 3 and 4 is very distinctly erect or semi-erect while in *macularis* all hair on the tergites is recumbent ; in ♂ *semiauriceps* there is only one *ad* seta on the mid tibia (exceptionally a second very small *ad* seta) while in all ♂ *macularis* seen there are two strong *ad* setae on mid tibia (character possibly not constant) ; in *semiauriceps* the epistome is distinctly longer and slightly more prominent than

in *macularis* and the vibrissae therefore conspicuously further from the mouth-margin than in *macularis*.

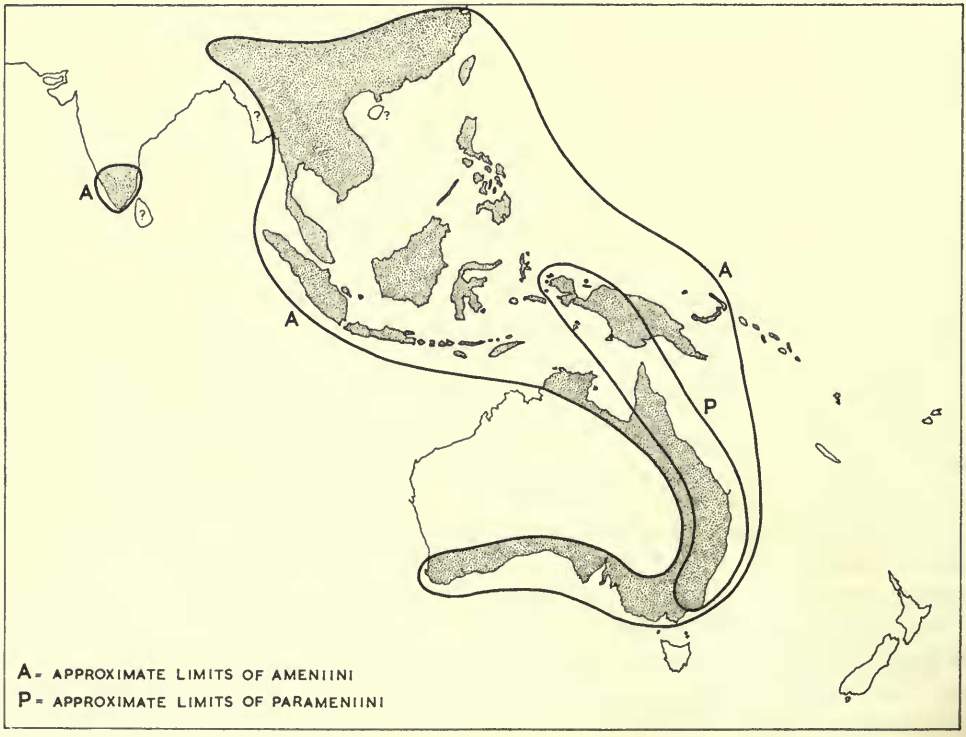
The unusually broad gena and relatively short eye distinguish *semiauriceps* from all the other species.

Paramenia sp. indet.

Three female specimens of *Paramenia* have been seen which cannot be reliably assigned to any of the foregoing species, and which may represent a new species ; at present it is premature to describe these as new, especially in the absence of associated males, but the characters by which they differ from *P. angustifrons* sp. n., the most similar species, are indicated below.

Colour blue (not distinctly purple as in *angustifrons*) and genae and lower parafacials very intensely golden ; gena slightly broader and eye shorter in profile, gena 0·26–0·28 of eye-height (0·21–0·23 in *angustifrons*) ; vertex 0·61 as wide as one eye viewed from above (0·55–0·59 in *angustifrons*) ; antennae slightly shorter, third segment 4·6–4·8 times as long as second segment (5·0–5·1 in *angustifrons*). In other respects very similar to *P. angustifrons* sp. n. and agreeing with this species in having in the female only one strong isolated *ad* seta on mid tibia (in *P. semiauriceps* always at least two such setae in female).

Data of the specimens are 3 ♀♀, AUSTRALIA : Queensland, 14 mls. N.W. of Brisbane, 27.xii.1959 (*R. Straatman*) (Div. Ent. Mus. Canberra and B.M. Nat. Hist.)



SUMMARY OF REVISED CLASSIFICATION OF AMENIINE FLIES

Names in synonymy indented : T.-S. = type-species of genus having priority.

Family CALLIPHORIDAE Brauer and Bergenstamm, 1889

Subfamily AMENIINAE Brauer and Bergenstamm, 1889

Tribe AMENIINI Brauer and Bergenstamm, 1889

Genus *SILBOMYIA* Macquart, 1843
STILBOMYIA Agassiz, 1846
MEGALOPREPES Bigot, 1859 **syn. n.**
SPINTHEMYIA Bigot, 1859
albonotata (Bigot, 1859) **comb. n.**
prospera (Walker, 1860) **syn. n.**
nitidissima Vollenhaven, 1863 **syn. n.**
philippinensis sp. n.
fulgida (Bigot, 1859)
sumba sp. n.
palawana sp. n.
parvula Baranov, 1938
minor Malloch, 1930
timorensis sp. n.
fuscipennis (Fabricius, 1805) T.-S.
mackerrasi sp. n.
latigena Enderlein, 1936
sauteri Enderlein, 1936
sauteri var. *viridis* Enderlein, 1936
hoeneana Enderlein, 1936
asiatica sp. n.
metallica sp. n.

Genus *PLATYTROPESA* Macquart, 1851
LIOSTIRIA Enderlein, 1936 **syn. n.**
auriceps Macquart, 1851 T.-S.
opulenta (Walker, 1859) **syn. n.**
decrescens (Walker, 1864) **syn. n.**
dubia (Malloch, 1935) **comb. n.**
ralumensis (Enderlein, 1936) **syn. n.**
simulans sp. n.

Genus *STILBOMYELLA* Malloch, 1935
DOLESCHALLIUS Enderlein, 1936 **syn. n.**
nigrocostalis (Doleschall, 1858) **comb. n.**
gloriosa (Walker, 1859) **syn. n.**
costalis (Walker, 1860) **syn. n.**
diffusa (Walker, 1861) **syn. n.**
nitens Malloch, 1935 T.-S.

Genus *PARAPLATYTROPESA* gen. n.
rieki (Paramonov, 1957) **comb. n.** T.-S.

Genus *AMENIA* Robineau-Desvoidy, 1830
PTYLOSTYLUM Macquart, 1851
NEOAMENIA Malloch, 1930 **syn. n.**
CHAETAMENIA Enderlein, 1936 **syn. n.**
sexpunctata Malloch, 1933
imperialis imperialis Robineau-Desvoidy, 1830 T.-S.
imperialis dubitalis Malloch, 1927 **stat. n.**
latifrons (Enderlein, 1936) **syn. n.**
leonina leonina (Fabricius, 1775)
stictica Engel, 1925
leonina albomaculata (Macquart, 1851) **stat. n.**
leonina enderleini Paramonov, 1957 **syn. n.**
longicornis (Malloch, 1930)
chrysame (Walker, 1849)
varia (Walker, 1852) **syn. n.**
parva Schiner, 1868

Genus *FORMOSIOMIMA* Enderlein, 1936
nigromaculata (Malloch, 1927) **comb. n.**, T.-S.
imitatrix Enderlein, 1936 **syn. n.**

Tribe PARAMENIINI Enderlein, 1936

Genus *PARAMENIA* Brauer and Bergenstamm, 1889
CALLIPHOROPSIS Townsend, 1915
angustifrons sp. n.
divitiosa (Walker, 1864) **comb. n.**
macularis (Walker, 1859)
semiauriceps Brauer and Bergenstamm, 1889 T.-S.

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